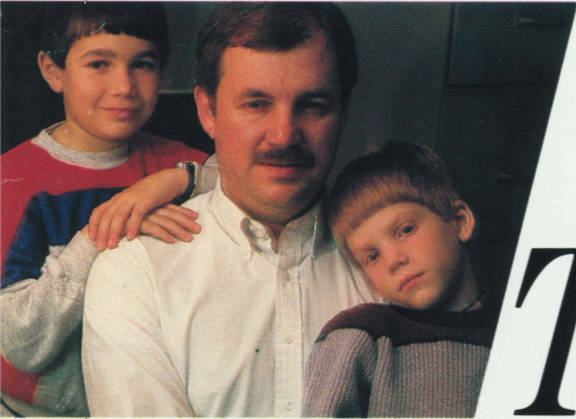


*Twenty-Two Innovative
Educational Uses
for Apple II Computers*



The Apple II

IDEAS BOOK





A+ *The Apple II*
**IDEA
BOOK**

Dear Readers,

In the May 1987 issue, A+ magazine announced the first annual "How I Use the II to Teach" contest. We encouraged readers to tell us in 500 words or fewer how they used an Apple II computer to teach, either in a classroom or at home. The response to the contest was impressive—we received almost 900 entries.

The winning entries were so good that we've put together the Idea Book to share a few of them with you. For any of you interested in trying out one or two of these ideas, we provide information about the software and hardware each project involved. If you would like more details, we encourage you to write to the Idea authors c/o A+ magazine, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

The Idea Book is all about Apple II computers. More important, it recognizes the outstanding instructional creativity of the individual contributors. We hope you enjoy their ideas and that they inspire ideas of your own that enrich your educational-computing activities in the future.

We would like to thank John Marvelle for his help in editing the stories in the Idea Book, and Apple Computer, Inc., for making this book possible.

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A+ The Apple II IDEA BOOK



The Apple Unifie



After a decade of perfect attendance, we couldn't help but learn a very important lesson.

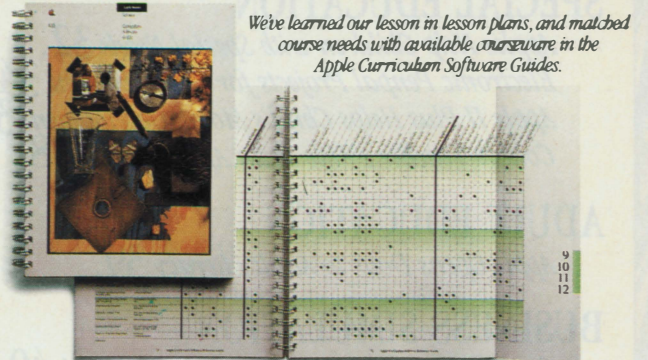
No two school systems are the same.

And no two have the same computing needs.

So to meet the requirements of diverse teaching, administrative and student bodies, we developed a system.

The Apple® Unified School System.

It's an impressive array of products and services from which any school, big or small, can select comprehensive solutions for their particular computing needs.



We've learned our lesson in lesson plans, and matched course needs with available courseware in the Apple Curriculum Software Guides.

Whether it's labs for special education, help with curriculum planning, or a new approach to old administrative chores.

The best way to do all this, we've learned, is to have something for every body.

For students in K-8, there's the Apple IIe. With the world's largest library of educational software, it's at the head of the class.

For high school students, there's the Macintosh™ Plus. It's a great study aid for college prep courses, runs the most advanced business software around,

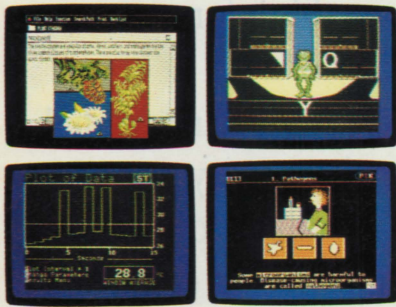


The Apple IIe and Apple IIGS form a great team for any school.

Apple Unified School System.

and is the computer of choice at leading universities.

And there's the Apple IIGs.™ It can run virtually all existing Apple II programs. And has an incredible ability to show and tell.



Each Apple Learning Series offers software that easily integrates the computer into the classroom.

Show with superior graphics and a palette of over 4,000 colors. Tell with a synthesizer that can

simulate anything from a French teacher to a French horn.

The IIGs is also an invaluable teacher's aide. As a powerful workstation, it excels in managing everyday classroom tasks, like writing reports, attending to attendance, and making the grades.

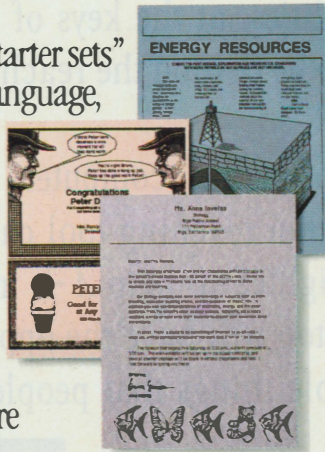
What's more, we've made it easy to integrate the Apple II family into the classroom with the Apple Learning Series.

These software "starter sets" are available for Early Language, Life Science and Health Education, with many more to come.

We've even done our homework so teachers and curriculum coordinators can easily choose software that meets their needs.

The result is the Apple Curriculum Software Guides. These indispensable manuals can help you select the best rated software for math, science, reading, writing and language skills. In other words, most of the subjects you teach.

Naturally, not all of our ten years were spent in the classroom. We've spent our fair share of time in the principal's office, too.



With desktop publishing, any school paper can look first class.

Which brings us to administrators and the Macintosh SE. The computer powerful enough to run an entire school district. With point-and-click technology, anyone can learn to use the SE without costly training. So anyone can take care of anything from



Put a Macintosh and LaserWriter together and you've just expanded the power of the administration.

tracking attendance to preparing budgets.

Add a LaserWriter® Printer and you've got a desktop publishing system. And with it, the power to produce more persuasive presentations, more interesting newsletters, even graphic proposals for additional Apple computers.

Of course as good as all of the above products are, they don't work by themselves. That's why our school system has a support system.

For instance, in the last three years we helped train more than 15,000 teachers and administrators to make better use of their computers.

And to help educators be as productive in their living rooms as in their classrooms, we developed the Educator Buy Program: a special discount on the most popular Apple products in school.

We've even made it easy to learn how our school system can work for yours. Just call 800-538-9696, extension 480, for more information.

The Apple Unified School System.

You'll find it's the most comprehensive computing program ever developed for education.

And, thanks to you, we're learning new ways to expand it every day. 🍏 The power to be your best.™

Every two and a half years, the amount of information in the world doubles. By the time today's kindergartners graduate from high school, it will have increased sixteenfold.

Will people drown in this sea of information because they lack the tools to cope? Or will they learn to use this information to think, create, and make better decisions?

We at Apple have explored that question since our personal computers first appeared in schools more than ten years ago.

FOREWORD We've sat in on classes, talked to students, sought the experience of countless educators, and sponsored some of the most ambitious classroom research going on in education today.

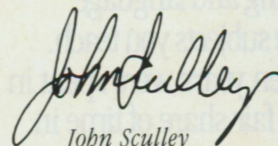
And we've learned.

We've learned that students are often more expressive when they write stories with a computer than with a pencil. We've learned that computers can clearly demonstrate complex scientific concepts that once baffled all but a few. We've learned that individuals with disabilities, at the keys of a computer, can accomplish feats that used to be beyond the reach of even the most gifted students.

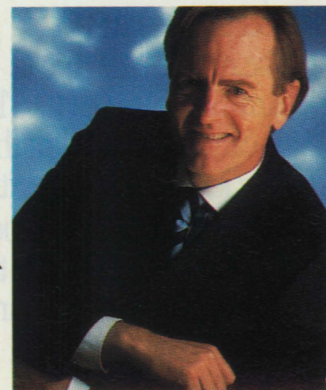
Above all, we've learned that computers make learning enjoyable in ways that no other teaching tool can.

That's why we were delighted to help *A+* magazine publish this book. Because now you too will have the opportunity to learn about some of the remarkable things that people are doing with Apple computers.

I hope that you'll enjoy the stories told here and that you'll come away from them feeling as inspired as we do.



John Sculley
President and Chairman
Apple Computer, Inc.



Congratulations to *A+* for this important book, which not only suggests and celebrates clever educational uses of Apple II computers but also has a deeper significance.

In these varied stories of successful teachers and parents, students and family members is real-life evidence of this late-20th-century reality:

$P + T + I + D = A$

That is:

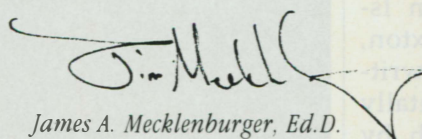
People + Technological power + Imagination + Determination
= Accomplishments

This formula, which rings true for business and space exploration, government and entertainment alike, is especially vital for education.

The testimony in these pages underscores how video and telecommunications, together with computing power, can be essential ingredients in achieving a vital goal: more and better education for Americans.

This formula is as true for those who teach as for those who learn! Computers and other modern technologies have changed for the better what imaginative and dedicated people can accomplish educationally.

Unfortunately, not enough Americans understand this quantum leap for education yet. *A+* magazine, by collecting and telling these lively and often heartwarming stories, contributes to the urgent task of spreading the word that putting America's technological knowhow to work in education can make an extraordinary difference.



James A. Mecklenburger, Ed.D.
Director

Institute for the Transfer of Technology to Education
National School Boards Association



Michael Blyth teaches murder-mystery writing to junior- and senior-high students with *Compudunit*, a curriculum guide based on AppleWorks.

Apples Help Write **MYSTERY STORIES**

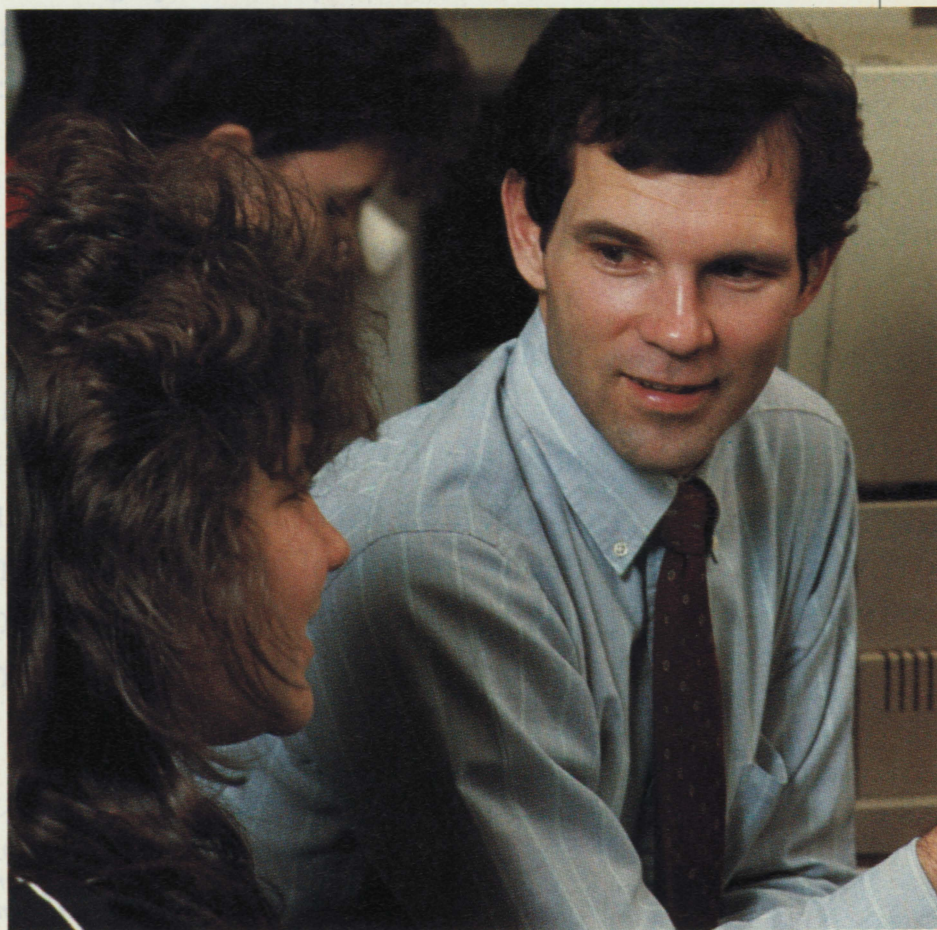
except his razor-sharp instincts and a stomach as hard as the city's streets. With the help of rookie cop Tom Pesco and the assistance of the newly widowed Adrian Raxton, O'Rourke has a fighting chance. Can you guess whodunit? Was it Linstien, the greedy shrink; Lester, the pathetic emotional wreck; or Cavano, the unscrupulous publisher who wouldn't take "no" for an answer? Or, maybe it was Linda Donaldson, Bernie Raxton's agent.

Welcome to the world of whodunits, in which ghostly murders are committed for rea-

"Upon investigating the murder scene," explained Sergeant Michael O'Rourke, "it was clear that Bernie was an intended victim, not just an innocent victim of a bungled robbery. There's no sign of a forced entry or any kind of struggle. In other words, Adrian, your husband knew his attacker. I theorize that he refused his attacker some type of request, and if my theory holds water, the attacker just figured that having Bernie dead would solve the problem. Remember . . . dead men tell no tales . . ."

I'd like you to meet Sergeant Michael O'Rourke; he's one of New York City's finest detectives. After 19 years on the force, O'Rourke has finally met a real challenge. In Staten Island, New York, Bernie Raxton, a harmless and innocent writing teacher, has been brutally murdered, beaten to death by his own trophy.

O'Rourke has little to go on



sons of greed, jealousy, power, and every vice known to mankind. The whodunit is a form of literature with universal appeal, because people never stop craving a good mystery.

I developed a writing curriculum called Compudunit to allow junior- and senior-high-school students the opportunity to write their own mysteries by using a computer and the AppleWorks word-processing module. The curriculum guide walks students through the development of their very own murder mystery from the beginning, when a body is found,

to the end, when the murderer is caught. In the process, students learn about the whodunit as a literary genre through analysis, reading, and writing.

With the trusty AppleWorks word-processing module, an Apple IIe, Compudunit outlines (which are AppleWorks templates), and a vivid imagination, anyone can learn to be a mystery author.

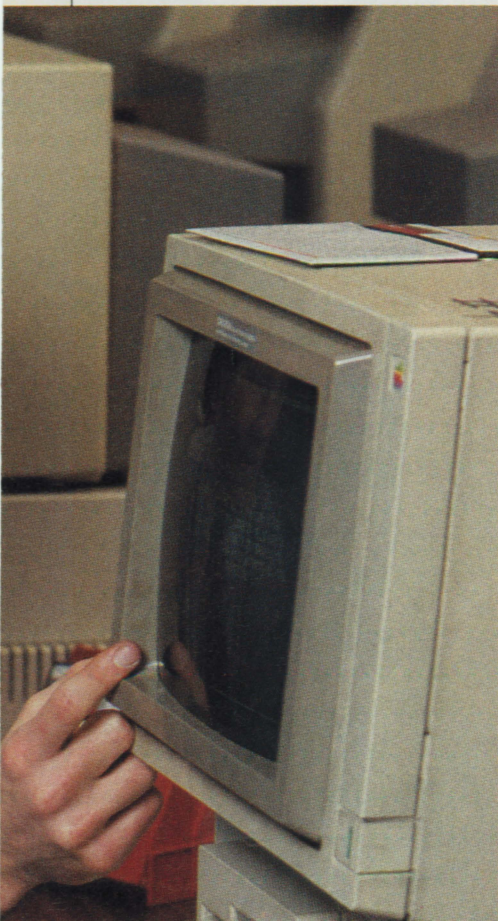
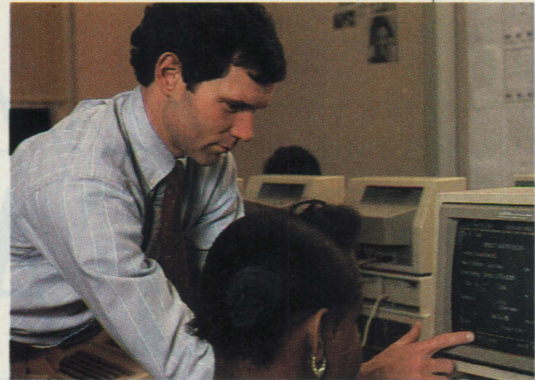
Compudunit offers me the flexibility of using parts of the guide or the entire curriculum, depending on the needs of my students. By using Compudunit, my students come to realize that writing can be a challenging and fun activity. It offers them a chance to expand critical-thinking skills and analytical abilities, since they must create complex plots and establish believable motives.

Michael Blyth is the computer coordinator at Concord High School and adviser for the Paxton Center Apple Computer Club in Staten Island, New York. Inspired by Michael, teachers throughout the New York City area are currently helping to write the latest Compudunit mystery by logging onto the Learning Link, Channel 13—WNET's electronic bulletin board.

HARDWARE/SOFTWARE/SERVICES

Apple IIe (*Apple Computer, Inc.*)
AppleWorks (*Claris Corporation*)

Michael uses Compudunit to take the mystery out of writing mystery stories.



Franklin Cacciutto uses the Apple II to create programs that help teach students from grade 2 through graduate school how to write lyric poetry.

The Apple and **CREATIVE WRITING**

Can a computer create a poem? Hardly a new question. As early as the 70s, computers in classrooms were randomly stringing together words and phrases that often expressed the freshness and vitality of poetry. And for some time now, software programs have been available that guide students through the creation of poems in the cinquain and haiku forms, simple and short. But what of the grander sonnet and the elaborate 14th-century French lyric forms—the sestina, rondeau, and villanelle—in which modern poets from Kipling through Auden and Ashbery have had success? Can a computer help a student or a whole class write a traditional sestina, a complex 39-line poem?

As a secondary-school English teacher of creative writing and as an in-service instructor of fellow teachers in my course *Teaching Children to Write Poetry*, I have a special interest in

this question. From the start, I perceived a connection between computers and creative writing. Process writing and word-processing overlap semantically. Computers deeply engage the interest and creativity of children, and are the perfect guide to mastering complex forms. Where there are rules and formal requirements, you will find programmability. Couldn't a creative-writing program then guide writers through the complexities of creation in simple programmed stages?

Motivated to answer this question, I decided to master the BASIC programming language—not a difficult step with the help of Apple II manuals.

Over a summer, I incorporated as much as I could of all I knew about teaching and all I was learning about computer programming into my program. The latest version uses interactive programming and old-fashioned revision and rewriting,

facilitated by word-processing features. The modeling approach to composition gets the students writing; then process-writing techniques guide and support them through the development of their poem. Each program includes examples of each form, from Dante and Petrarch to Auden and contemporary writers, as well as poems that students—from second



K

grade to graduate school—have written with the program. As the students complete their poems, they are filed in the program's table of contents for ready reference, revision, or printout for publication. Although no prior knowledge of the lyric forms, computer programming, and word processing is necessary, the students learn about each.

Frank Cacciutto is the chairman of the English department at East Meadow High School, East Meadow, New York, and a widely published poet.

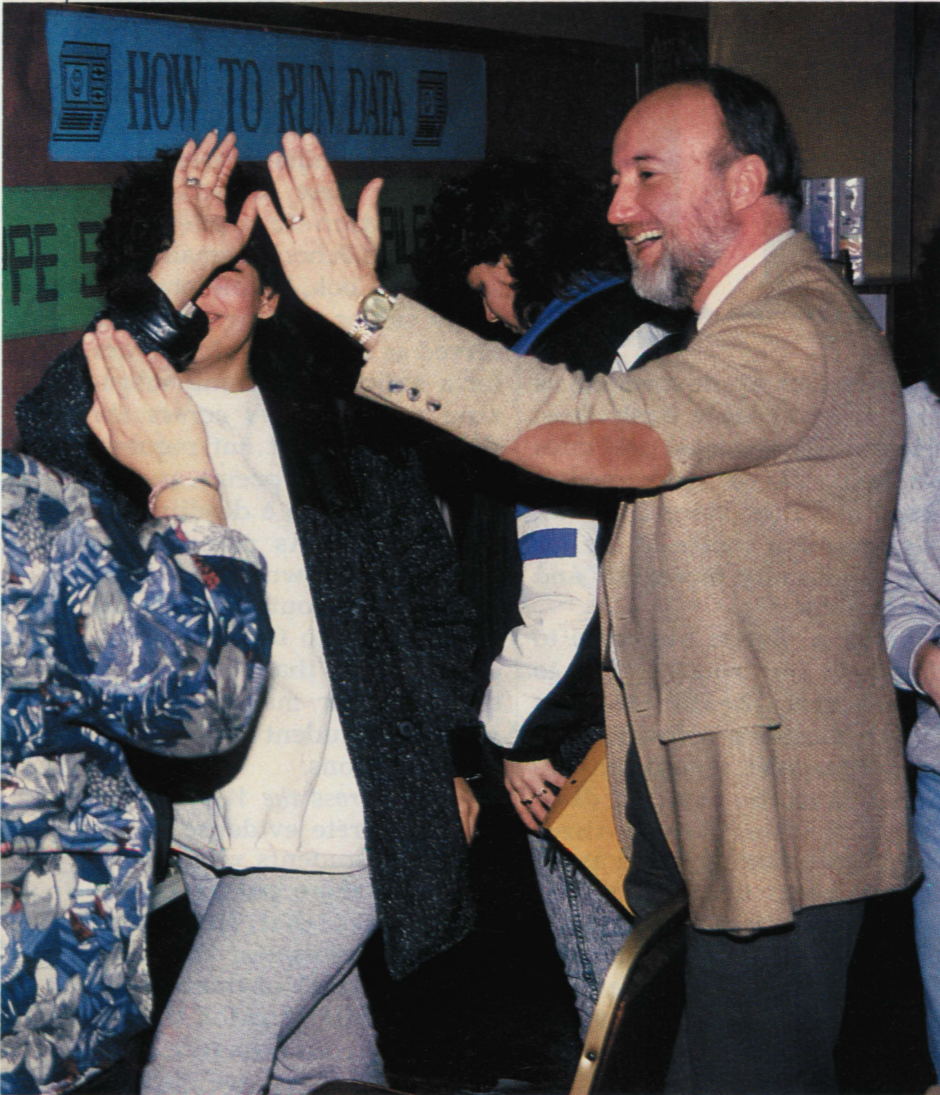
HARDWARE/SOFTWARE/SERVICES

- Apple IIe (Apple Computer, Inc.)
- ImageWriter II (Apple Computer, Inc.)
- AppleSoft BASIC (Apple Computer, Inc.)

Frank watches while his students work with his poetry-writing program.



MICHAEL STANCO III



Small mail takes the Postal Ser-
vice or E-mail. Which carries
more excitement is more de-
pendable, more accessible? My
Apple IIe and E-mail (electronic
mail) have shrunk the size of
this country. My senior writing
students feel a bond with high-
school kids in Pennsylvania,
New Mexico, Maine, Texas, and
Minnesota. An electronic hand-
shake is going on each day in
my classroom when we log onto
InterNet, a national network of
English teachers. Whom will we
invite to our class today? Wil-
liam, Montana kids? Cook Min-
nesota friends? Fort Wingate
High School students? These
varied voices have traveled
through the wires, into our
computers, onto our screens,
into our desks, and out to our

Kenneth Holvig adds a new dimension to his writing classes by introducing his students to other students around the world via electronic mail.

Building Writing Skills through **ELECTRONIC MAIL**

Snail mail (aka the Postal Service) or E-mail? Which carries more excitement, is more dependable, more accessible? My Apple IIe and E-mail (electronic mail) have shrunk the size of this country. My senior writing students feel a bond with high-school kids in Pennsylvania, New Mexico, Maine, Texas, and Minnesota. An electronic handshake is going on each day in my classroom when we log onto BreadNet, a national network of English teachers. Whom will we invite to our class today? Wilsall, Montana kids? Cook, Minnesota friends? Fort Wingate High School students? These varied voices have traveled through the wires, into our computers, onto our screens, onto our disks, and out to our

printers. Our Apple connects us daily to new people, fresh ideas, celebratory messages, and cries for help. We've nicknamed it Bread n' Butter, since BreadNet has become a source of life for our community of writers and researchers.

Bread n' Butter has come to dominate our routine. Get to class. Boot up the Point-to-Point communications software. Log onto BreadNet. Check the E-mail. Save the mail to disk. Print the file. Twenty-three computers start whirring as everyone boots up AppleWorks. We write letters, edit stories, print files, prepare manuscripts for electronic transfer. We try to describe our community. We imagine life in places where our BreadNet friends live.

Our BreadNet connection has given us new motivation to write, to inquire, to learn. No stagnant compositions about summer vacations or favorite pets. We have been working on "voice" in our own writing, something that has become much easier to understand since we have heard so many unique "voices" in the writing we have collected from BreadNetters everywhere.

My classes have exchanged letters with fourth-grade students in our own community. They have written to Navajo Indian kids at Wingate High School, an Indian reservation school in New Mexico. They have written to students at Cook High School, a small rural school in Cook, Minnesota.

My senior writing class has served as the publishing center for a national electronic magazine called *Voices across the Wires II*. We sent out requests for short stories, poems, and essays, along with a deadline for submissions. As manuscripts arrived, we downloaded them, printed them out, and put the hard copy into folders. We received more than 60 submissions for our magazine, from which the student editors made final selections.

Voices across the Wires II became concrete evidence of the work my students were doing. We could share poems, essays, and stories that first came zooming across our computer monitors. Many of those works stirred our imagination and fed our appetite for literature.

My colleagues are curious.

My students are interested, excited, and involved. I am absolutely convinced that BreadNet is a lifeline connecting me, via my Apple, to those "in need" and those "I need." It has added a dimension to my teaching that I cannot measure. I can only call it addicting, fulfilling, challenging, and miraculous.

Kenneth Holvig has worked as an English and writing teacher at Clarkstown South High School, West Nyack, New York, for the

past 15 years. Ken and his colleagues on BreadNet have recently completed the fourth edition of Voices across the Wires, which for the first time includes work by students outside the United States.

HARDWARE/SOFTWARE/SERVICES

- Apple IIe and IIGS (*Apple Computer, Inc.*)
- Prometheus 1200A modem (*Prometheus Products, Inc.*)
- Point-to-Point (*Pinpoint Publishing*)
- AppleWorks (*Claris Corporation*)

Ken goes on-line to discuss writing assignments with his students.



VINCENT DI SALVIO

Andrew Fleming uses his Apple IIGS and 'paint' software to develop his four-year-old daughter's visual-literacy skills. She can use the computer for endless experimentation in color, form, and composition.

Apple IIGS Enlivens **ARTISTIC CONCEPTS**

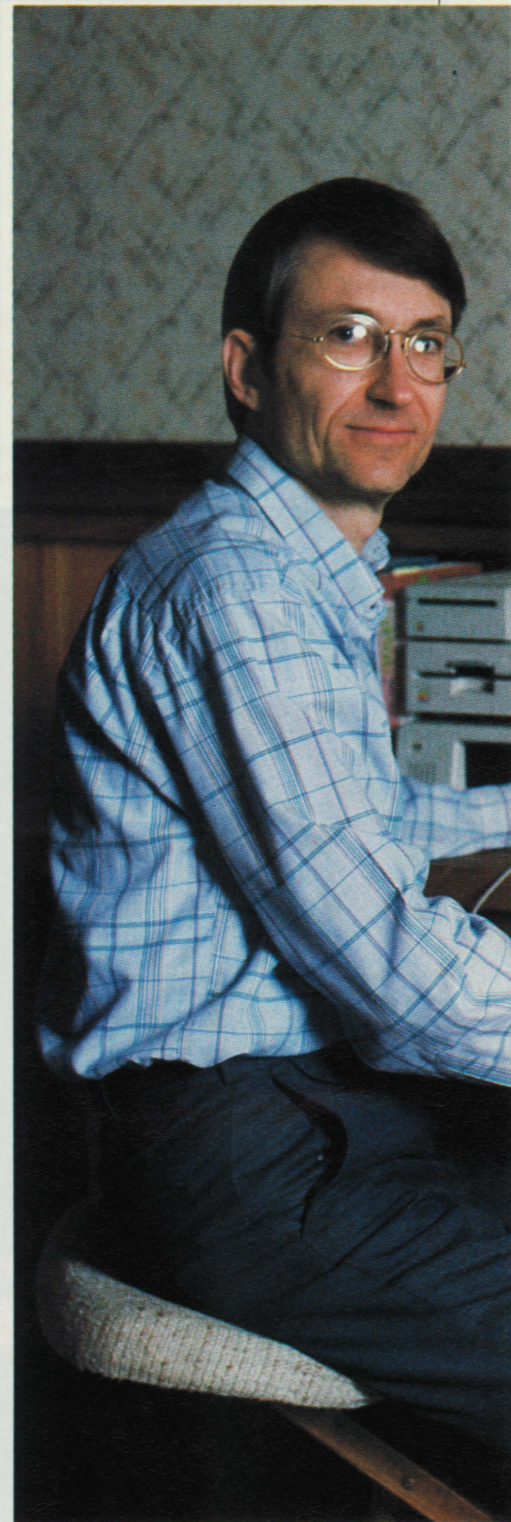
Educators are becoming increasingly aware of the importance of art education for the development of skill in visual perception. Effective visual perception is fundamental to learning in any field and is essential to productive thinking. The Apple IIGS has been an incredible asset for us in teaching this critical skill to our children. Let me share how amazingly well our Apple developed our four-year-old Rebecca's visual "literacy" as I taught her art, using a paint program called DeluxePaint II.

Rebecca quickly became familiar with the Apple's operation, even though she is not yet a reader, by virtue of the visually oriented "Apple Tour" that came with our new computer. She was strongly motivated to use the computer as she discovered its amazing capabilities. It's great that the Apple capitalizes on children's and adults' ability to learn much more quickly by playing with something than by reading about it.

My approach has been to al-

low the freedom of continual experimentation, a great virtue of this medium, while systematically developing basic concepts dealing with color, line, and composition. Becca sits down at the Apple several times a day to experiment with the way colors go together. Sometimes I have her make up her own palette—of favorite colors, of colors that harmonize, or of colors she sees in the landscape outside the window. Imagine a four-year-old selecting a color, modifying its hue by adding or subtracting other colors, and then adjusting its value by sliding it from light to dark to match a flower, tree, or hill outside.

The computer is also a powerful aid in teaching about line and form. By having Becca make a free design with one of the line tools and then fill some segments with color, I can dramatically convey the idea that lines make shapes. She can then easily see that their contrast with the background creates a sense of space. She gains valu-



By experimenting with shapes and palettes, Andrew's daughter Rebecca learns about color and perspective.



able practice in relational observations of changing sizes and shapes when she plays with the geometric forms built into the paint program. By having her copy shapes and repeat them, I help her discover how to create patterns.

Composition, one of the more advanced concepts in art, is much easier to teach on a computer than with other media. Becca can create an element of a picture—a tree, for example—and then move it all over the background until she is pleased with its placement. By changing the tree's size, with a click of the mouse, and overlapping other elements with it, she learns how to create a sense of depth. Experimentation that could fill a wastebasket with balled up paper takes place in minutes and without discouragement.

I am amazed by Rebecca's rapid development of visual discrimination and learning of principles of form, color, and composition. I know that our Apple IIGS is equipping her with an invaluable advantage in life, no matter what she ultimately does with her talents.

Rev. Andrew Fleming, currently a Seventh Day Adventist minister, has worked as an illustrator for a scientific journal. Both he and his wife, Arlo, have a keen interest in communication through the visual arts and are "home schooling" their children, Ariel, age 9, and Rebecca, age 4.

HARDWARE/SOFTWARE/SERVICES

Apple IIGS (Apple Computer, Inc.)
DeluxePaint II (Electronic Arts)

Nancy Fortran's students learn about color as pigment and light, using an Apple IIe computer and Brøderbund's Science Toolkit.

Apple Helps Teacher Introduce COLOR THEORY

Computers can assist in the educational development of children in all curricular areas, and art is no exception.

I have developed a unit that not only reinforces color theory but also increases students' knowledge of the computer as a research tool. In this unit students study color as pigment and light.

My art-education project consists of three phases, including a traditional art lesson on each topic. The first phase teaches the spectrum, rainbow formation, color absorption and reflection, light transmission, pigment mixture, and color theory through discussions and study sheets. On completion, students have an understanding of the basics of color and light theory.

In phase 2, computer-assisted instruction begins, using an Ap-

ple IIe and Brøderbund's Science Toolkit. Aided by a demonstration, students use the Science Toolkit and teacher-prepared slides to compare the light-transmission capabilities of materials. The results enable the students to classify each slide as transparent, translucent, or opaque. When they've completed the research, the learners answer questions requiring comparisons of their results with assorted art materials having varying levels of transparency; e.g., watercolor, tempera, acrylic, oil paints, and oil pastels. As an evaluation, students demonstrate their knowledge by applying paint in a transparent-to-opaque manner.

During the study of light transmission, lab groups use cellophane slides to test the premise that various colors let dif-

ferent quantities of light pass through. These observations include testing different values of each color. After having worked with the cellophane slides, the groups use translucent slides made of assorted colors of tissue paper. The students demonstrate their knowledge of this phase by organizing the spectral colors according to their light-transmission capabilities.

Phase 3 involves learners in experiments in light absorption. They conduct experiments, again with Science Toolkit, to determine which colors produce the greatest amount of heat through light absorption. Each group records the temperature change when the basic colors are exposed to a light source. After the testing, students compile their results with the warm and cool colors.

This carefully planned unit of study, using the Apple II, gives students an understanding of color as art and science in an interesting and enjoyable learning experience.

Nancy Fortran teaches art to children in grades K-5 at the Aurora Public Schools, Aurora, Colorado. Lately, Nancy can be found helping Mountain Bell organize the computer component of a special after-school program called Focus on Children and using her Apple IIe to prepare to market her soft-sculpture patterns.

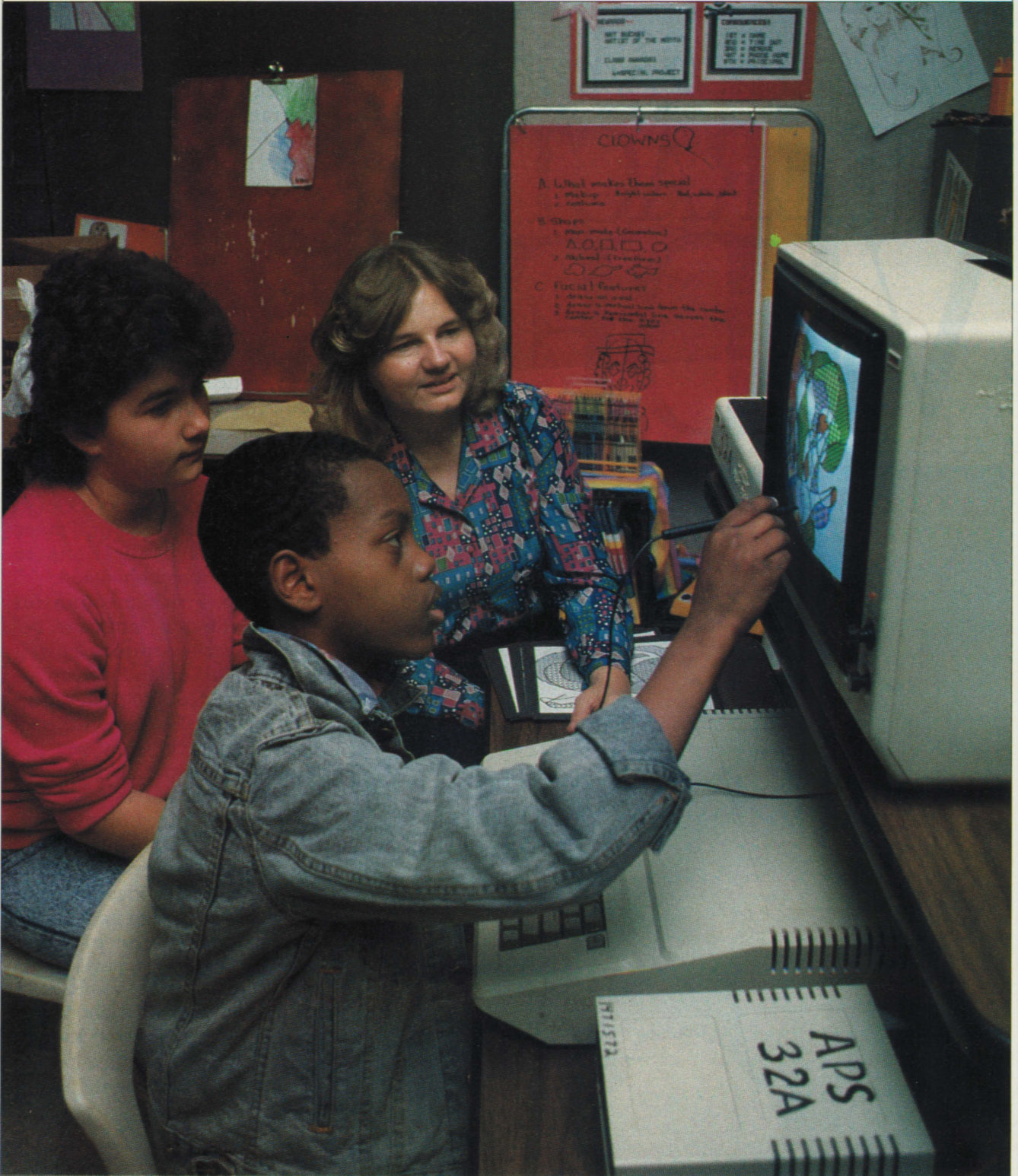
HARDWARE/SOFTWARE/SERVICES

Apple IIe (**Apple Computer, Inc.**)
Science Toolkit (**Brøderbund Software**)

H

school students foreign language and culture with an Apple IIe and videotape

One of Nancy's students uses a light pen to discover the properties of color.



Helen Hamerstrom teaches her high-school students foreign language and culture with an Apple IIe and videotapes that she recorded in France.

Apples Teach French with INTERACTIVE VIDEO

In our high school, we use videos and computers together to enhance our foreign-language curriculum. Interactive video programs consist of a video segment on tape or disc whose display is controlled by a connected computer. The computer reads the frame numbers encoded on the videotape or disc, allowing students to access any segment of the video program.

I completed my first interactive-video project in 1986, using videotape footage that I had taken in France. With my Apple IIe connected to my VCR, I wrote a program that controlled the video player by specifying the frame numbers for display. The program takes students through various experiences in France and then asks questions to check their comprehension.

Video is a rich medium for teaching foreign language because it teaches culture as well as language. For students, an interactive video program simulates an actual experience in a foreign country. They see the countryside, experience the culture, and hear native speech at full speed. It gives them a few minutes of "really being there."

I usually have my students watch the whole videotape first. Afterwards, they go back to answer questions the program poses and study the parts of the tape that are most difficult. I have discovered that short segments (3-10 minutes in length) work best for one class period and are within students' atten-



A student helps Helen demonstrate one of her interactive-video lessons.

Beverly Carmean has developed a medical-technology program for high-school students, using the Apple IIe as a tutor and monitoring device.

tion span. The best part of having my Apple work with a VCR is that it lets me use my own videotapes and edit them to include just what I want.

I was able to interest other members of my department in the project, and we've expanded the use of interactive video into Spanish and German classes. Using authoring software called SuperPILOT, even the nonprogramming teachers and some students are writing interactive video lessons.

With the advent of videodiscs for foreign languages, we've added an interactive videodisc station to our program. A videodisc system provides increased speed in accessing individual segments, durability of the disc, and a finished format (no editing required or possible).

Computer-controlled video is highly motivating. Because repeating video passages is simple, I find students are willing to keep reviewing them until they really understand. The students are very enthusiastic. Together, the Apple IIe and video are helping our students study foreign languages in a new and exciting way.

Helen Hamerstrom, of Arnold, Maryland, has been with the Anne-Arundel County School District for 20 years and chairs the Severna Park High School foreign-language department.

The Apple IIe Helps Run MED-TECH COURSE

In January 1986, in response to my urgings, Frankford High School gave me an enhanced Apple IIe computer to use in my senior elective medical-technology course.

Using sensors, detectors, and an interface box that I built, along with commercial software such as Experiments in Human Physiology and Biofeedback Microlab, my students monitor and record heart rate, respiration rate, skin temperature, and electrodermal activity with the Apple. The computer takes the measurements, and the students save the data and print graphs to compare responses.

I present my students with a problem and then acquaint them with the software they will use to delve into it. Early in the school year, we use the computer to investigate and measure response time. My students perform experiments to



A detector clip attached to a student's earlobe helps measure heart rate.

HARDWARE/SOFTWARE/SERVICES

Apple IIe (Apple Computer, Inc.)
SuperPILOT (APDA)

determine differences between dominant and nondominant hands in response to a light stimulus, a sound stimulus, and to a moving character on the screen.

Later in the year, we use our Apple to explore the factors (such as exercise, diet, and emotions) that influence an individual's heart or respiration rates. By attaching a light source and detector clip to students' earlobes, we can record changes in light as cells pass through capillaries. The computer records this information as heart rate and allows us to print out averages. We utilize temperature probes to record skin temperature and then graph the results. As a culminating exercise, we use all probes together and turn our computer into a biofeedback monitor or a "lie detector."

Our school's medical-technology course is the only one of its kind in the Philadelphia school system. Students who come into my class with little or no computer experience quickly become confident and willingly volunteer for any extra "duty" on the computer. To date, all of these urban youngsters in my medical-technology course have continued their education after graduation, most pursuing studies that have led to a health career.

Beverly Carmean has been teaching at Frankford High School in Philadelphia, Pennsylvania, for 23 years. Her medical-technology program has been recognized as exemplary by Board of Education evaluators, and she received a grant from the Philadelphia Renaissance for Science and Mathematics in recognition of the outstanding work in this class.

HARDWARE/SOFTWARE/SERVICES

Apple IIe (*Apple Computer, Inc.*)
Experiments in Human Physiology (*HRM*)
Biofeedback Microlab (*HRM*)

SCIENCE/MATHEMATICS

Apple II workstations help Rita Henry's ninth-grade students learn about astronomy and Earth science as they use an interactive-video simulation of space travel.

Earth-Science Students Become **SPACE TRAVELERS**

Although I have used an Apple II computer in my chemistry and Earth-science classes for many years (primarily for computer-assisted instruction, simulations, and lab work), last year my school district gave me the opportunity to design a new Earth-science curriculum. The result is a full-year, interactive-video Earth-science program that employs two specially designed Apple II workstations.

On one Apple II workstation (an audiovisual cart with an Apple II, monitor, ImageWriter II printer, Hayes 1200-bps modem, and videodisc player), my students find themselves on a space station in Alpha Centauri. They receive radio transmissions that seem to originate from Earth or its planetary environs. The content of the coded message indicates that intelligent life may exist there, thus

justifying an intergalactic trip to Earth's solar system. In the course of their mission to Earth, the students go through four lessons that make them apply what they have learned from their textbook readings and lectures. The program allows students to "fly" past stars and galaxies, study the sun and solar system, and explore other planets while on their way to Earth.

On the other Apple II workstation, which consists of an Apple II, a VCR, and a large display monitor, students can access portions of an earth-science videotape via a menu.

A telecommunications substation (on the rolling audiovisual cart that holds the interactive videodisc) complements the curriculum with activities such as logging onto CompuServe to participate in science and student forums, electroni-

Rita's students, using an Apple II workstation, find themselves on a simulated space voyage.

cally "clipping" newsworthy stories from major news databases, and downloading weather maps from the National Weather Service. Also, we are establishing a student-operated bulletin-board system.

In addition, I created computer graphics to motivate and reward the efforts of my students. These graphics take the form of certificates of achievement; banners announcing special events; and T-shirt transfers of the year's most significant celestial event, such as Halley's Comet '86 and the supernova of '87. At the end of the school year, we celebrate our computerized Earth-science experience by video-digitizing class pictures onto T-shirts.

Teaching with an Apple computer means closing the classroom door to keep the clamorous enthusiasm of my students from disturbing other classes. And it means recognizing the effect that exciting computer activities can have on students who might otherwise be left behind—slow achievers who gain speed with confidence and bored students who eagerly join the challenge of group learning with computers in science.

Rita Henry is a ninth-grade Earth-science teacher at Glen Ridge High School, Glen Ridge, New Jersey. A high-school science teacher for 24 years, she designed her project, entitled Mission: Earth, after her principal asked her to put together a year-long Earth-science course. Rita's course is now required of all ninth-graders.



HARDWARE/SOFTWARE/SERVICES

Two Apple II computers (*Apple Computer, Inc.*)
ImageWriter II (*Apple Computer, Inc.*)
Smartmodem 1200 (*Hayes*

Microcomputer Products, Inc.)
ComputerEyes (*Digital Vision*)
Astronomy and Earth-science laserdiscs (*Optical Data Corporation*)
CompuServe (*CompuServe Information Service, Inc.*)

Dr. Anthony Chiaramida uses an Apple II in a hospital intensive-care unit to supplement a medical training program. Students use the computer to simulate life-and-death decisions.

Apple II Trains Physicians in **INTENSIVE CARE**

I direct the intensive-care unit at the Raritan Bay Medical Center in New Jersey and also help guide the training of medical students, in addition to that of interns and residents.

Medical education is a complicated affair, requiring long hours of patient care in addition to didactic instruction. By the very nature of a training program, care of patients takes priority over scheduled lectures, which complicates getting a group of physicians in the same place at the same time. The task of a physician educator requires near constant availability, repetition of algorithmic methods of diagnosis and therapy, step-by-step instruction in various clinical scenarios of a disease, access to the newest clinical or re-

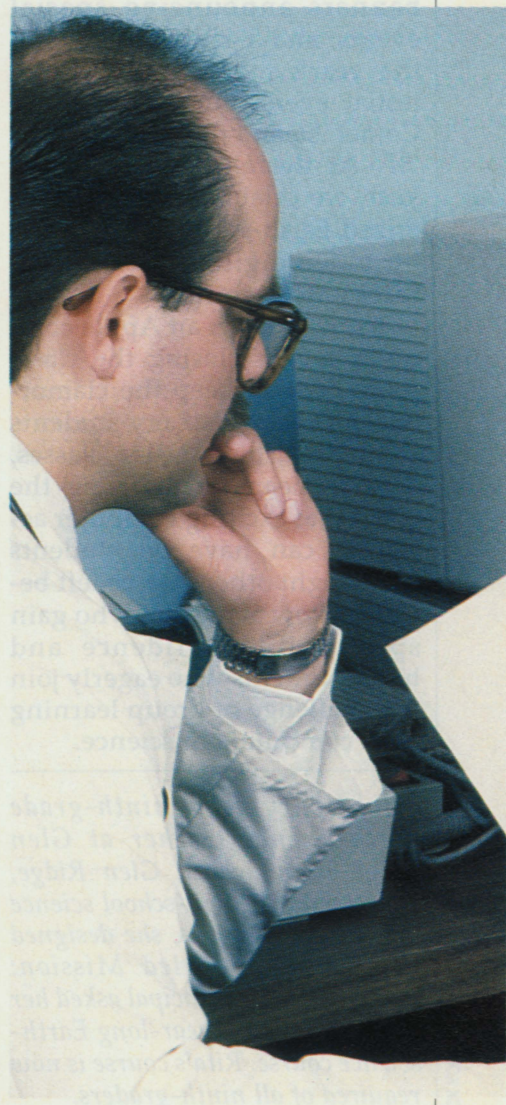
search information, and documentation of achievement.

A personal computer can help handle all of these tasks. For instance, I use a standardized program on CPR (cardiopulmonary resuscitation) that residents and interns use to simulate life-and-death decisions. The residents use the program at their convenience and are expected to demonstrate their ability to complete the sessions without error.

I also established a modem link with the National Library of Medicine, with which the residents can now access up-to-the-minute information on current in-house problems. Information on rare and unusual diseases, brand-new cancer therapies, and general articles

are literally at their fingertips.

In addition to establishing the modem link, I've made in-depth computer-assisted instruction (CAI) available on many select topics. The CAI programs emulate the basics of sound clinical training and provide a tireless, accessible, interactive instruction mode. I have also written clinical-physiology programs that evaluate hemodynamic variables the residents



obtain. They obtain and enter primary data, and the Apple II performs the calculations and provides a printout of the results. This method encourages collection of a complete database for analysis, since the system does not accept partial data entry.

The new frontiers of medicine require the ability to perform statistical analysis, which can be facilitated by a helpful

program that coaches correct data entry and allows rapid calculation of otherwise cumbersome, time-consuming data. Residents proposing research projects now have a tool that helps them design projects. They can establish how large a study needs to be, in view of an expected response, so that the study has a chance of establishing or refuting a hypothesis.

I have established a clinical

database that tracks newly admitted patients in terms of variables, providing feedback for residents on their diagnostic acumen.

The Apple II also provides a method for analysis of published information. I have prepared a calculation method for use with previously published data; it allows for generation of an objective clinical estimation of survival, which is useful in the intensive-care unit. The database is available to residents and nurses.

The Apple II allows interns, residents, and medical students to acquire didactic instruction, care for patients, do better medical research, maintain current information databases, and produce accurate data. In our medical center, the Apple II truly has become a cornerstone to improving medical education.

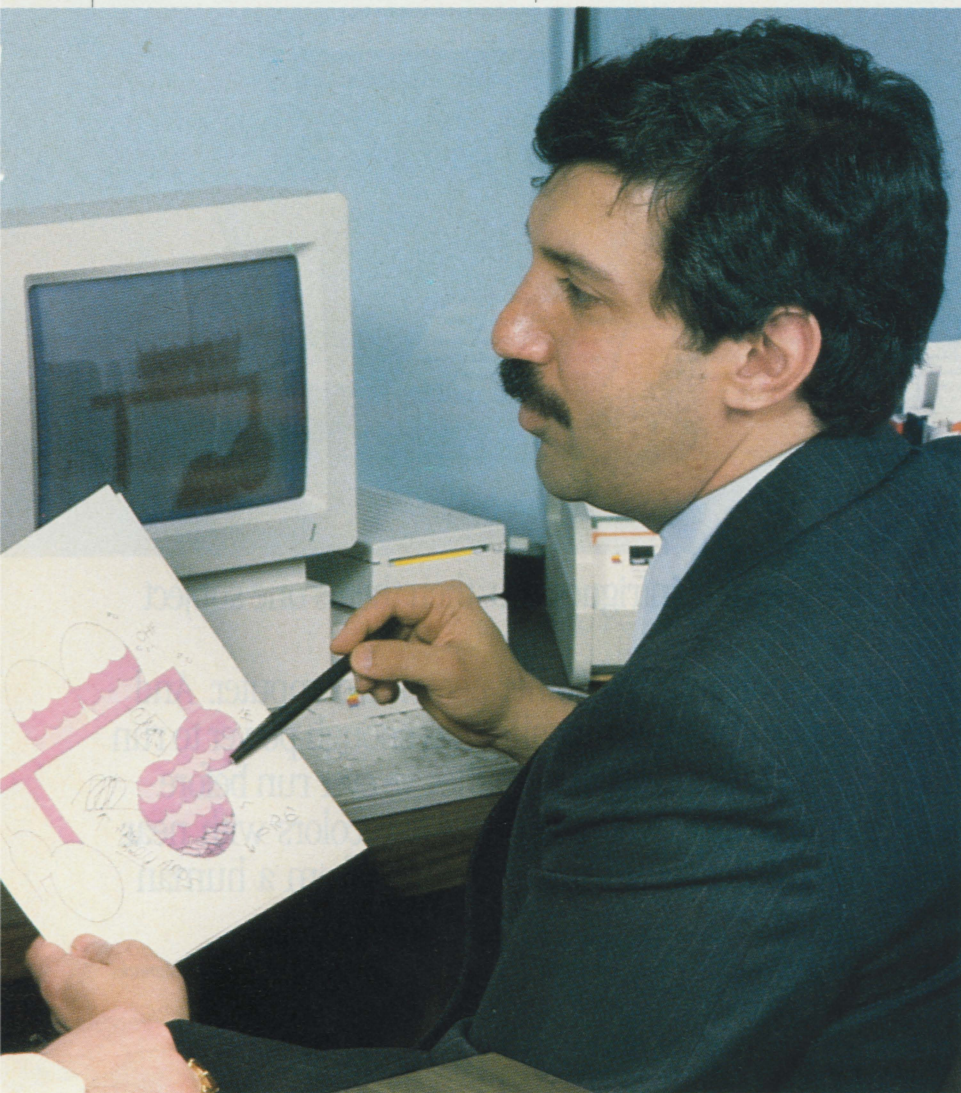
Dr. Anthony Chiaramida is a cardiologist at the Raritan Bay Medical Center, Perth Amboy, New Jersey. As a result of being recognized in the "How I Use the II to Teach" contest, he received a grant to buy additional Apple equipment for his program.

HARDWARE/SOFTWARE/SERVICES

- Apple IIe and IIGS (*Apple Computer, Inc.*)
- Micromodem II (*Hayes Microcomputer Products*)
- AppleWorks (*Claris Corporation*)
- Applesoft BASIC and Apple Pascal (*Apple Computer, Inc.*)

Dr. Chiaramida discusses a printout from one of his many medical-training programs.

PETER ACKERMAN



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SCIENCE MATHEMATICS

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Under the guidance of instructor Terence Nickolette, students and teachers work on all phases of a simulated space-shuttle mission, from astronaut training to extraterrestrial encounters.

Apple II Lab Becomes **MISSION CONTROL**

Last spring I transformed the computer lab at Lowell Academy (Lorain, Ohio) into a fully functioning Mission Control center for NASA's "Simulated Shuttle Launch." NASA's Lewis Research Center invited Lowell Academy of Math, Science & Fine Arts, a K-5 "magnet" school, to be one of eight area schools to participate in a simulated space-shuttle launch on April 8, 1987.

As part of the simulated shuttle launch program, students and teachers do everything involved in a real shuttle mission, from selecting and training astronauts and designing experiments to converting a school bus into a space shuttle. All of this groundwork is in preparation for launching and controlling the simulated space shuttle with 20 astronauts on board on an 80-mile journey to another "planet" and rendezvousing with eight other shuttles at

NASA's Lewis Research Center.

At our Mission Control center, students used our 11 Apple IIe computers to perform assigned tasks that were directly related to this mission. I assigned five groups of students the following jobs: radio operator, cartographer, information officer, experimental-systems monitor, and xenobiologist.

Student ham-radio operators, who remained in continuous contact with the school's shuttle, named the Leopard Express, relayed up-to-the-minute information on the shuttle's progress to the students working at Mission Control.

Student cartographers used a large-screen monitor to display maps of the mission to Mission Control visitors. The maps, created with a KoalaPad, displayed the current position of Leopard Express. As the Leopard Express traveled along its route, the maps were printed and dis-



played on the large bulletin board in Mission Control.

Information officers using a public-domain word-processing program wrote news releases describing the progress of the shuttle and the status of the on-board experiments. Using The Print Shop, information officers added graphics to their "Shuttle Update" reports before posting them in Mission Con-

Terry, who runs the computer lab at Lowell Academy in Lorain, Ohio, was the mastermind behind his school's successful space-shuttle simulation.



control. Copies of these updates also went to the press room, where they were read over the public-address system to the entire Lowell Academy student body.

Experimental-systems monitors had the job of translating data from shuttle experiments into graphs, using the MECC Graphing program. Graphs created several times during the

shuttle's voyage showed the status of the on-board systems of the shuttle: fuel, tire pressure, and electrical power. Experimental-systems monitors displayed these graphs on the bulletin board at Mission Control alongside the route maps and "Shuttle Update" reports.

Two students on the Leopard Express were xenobiologists, whose task it was to establish

contact with extraterrestrial life forms (the students of another participating school). Their mission was to give two diskettes, filled with graphic programs and messages from Lowell Academy students, to the encountered extraterrestrials.

The launch and return of the Leopard Express was a tremendous success. The students at Mission Control had a central role in that success. They explained the shuttle mission to the public who visited Mission Control, wrote about this real-time event, and generated and printed maps and graphs of the trip. In short, the students performed real jobs, experienced the pressure of a fast-paced event that they were a part of, and discovered how to troubleshoot problems as they occurred. These students will never forget this experience!

The Grand Prize Winner of A+ magazine's "How I Use the II to Teach" classroom category, Terry Nickolette has been teaching mathematics and science in Lorain since 1968. During the 1986-87 school year, Terry was appointed the computer-lab teacher at the Lowell Academy of Math, Science & Fine Arts, where he provides computer instruction for all students, grades 3-6.

HARDWARE/SOFTWARE/SERVICES

11 Apple IIe computers (*Apple Computer, Inc.*)

KoalaPad (*Koala Technologies*)

The Print Shop (*Brøderbund Software*)

Graphing (*MECC*)

When Brenda Conroy teaches piano, her Apple II stands right alongside the ivories, helping her students learn music fundamentals.

Apple and Piano Teacher Are **MAKING MUSIC**

As a private piano teacher, I have made my Apple II a vital part of my teaching. My students use the Apple daily, arriving 15 minutes before their lessons to use programs such as Music Theory by MECC and Music Matchup and Note Trespassing by Notable Software. Students learn time signatures, key signatures, and rhythms, which they tap out on the keyboard. They write scales with the joystick and learn terms and chords.

This surrogate music-theory teacher allows me to spend more time during each lesson working on students' keyboard performance. Novice students become excited about music and are motivated early in their music experience because it's fun. By using an Apple computer, I

equip my students with more music theory than lesson time permits me to teach at the keyboard. During the keyboard lesson, I reinforce the knowledge that they have already gained on the Apple.

During group lessons, two to four students can play musically oriented games on the Apple, which can become very competitive. Advanced students use my Yamaha PSR-70 electronic keyboard to compose songs and chord accompaniment. I plan to obtain a MIDI interface for the Apple so they can store and print these compositions.

I also use my Apple to make up a schedule of lesson days, times, and students' phone numbers. It allows the students to exchange lessons when conflicts arise and saves me much

time. Each semester I use the AppleWorks word-processing module to compose a letter for each student, stating policies and rates. The lesson schedule and policy letter are easy to update as changes occur.

I have started a database, categorizing articles from five music-related magazines. The database provides the ability to search for articles on specific teaching situations.

I also have plans to create an additional AppleWorks database so students will be able to locate and borrow sheet music from my collection.

Since I want to keep abreast of new music programs as they come to market, I am a member of and reviewer for the Computer Musicians Cooperative (CMC). When I review a program for the CMC *Minutes* magazine, I receive the program to keep, which allows me to continue obtaining the latest music-related software to better prepare my students.

Brenda Conroy, a former air-traffic controller, used to offer piano lessons as a way to relax and get away from the stresses of her job. Today, it's a full-time business. The Apple II became her teaching (and business) partner back in 1980.

HARDWARE/SOFTWARE/SERVICES

Apple IIe (*Apple Computer, Inc.*)

Music Theory (*MECC*)

Music Matchup, Note Trespassing (*Notable Software*)

AppleWorks (*Claris Corporation*)

Brenda's piano students use the IIfx to brush up on music theory before their lessons.



ALAN HARRADDER, JR.

Music teacher William Guegold works with his Apple IIGS computer to plan marching-band performances and teach students their parts.

Apple II Runs MARCHING BAND

As a high-school and college instrumental-music teacher (band director) and father of three children under the age of seven, I have found the Apple IIGS a valuable tool in and outside my classroom. I've used it to process

words, teach music theory, tutor preschool math and language, offer art instruction, build spreadsheets, manage databases, and design and teach marching-band drills. This last use is probably the most distinctive.

I use a software program from Pygraphics for charting the drills in my marching-band shows. The software provides a variety of "tools" that I use in designing shows, including basic shapes, free-form curves, odd arcs, a variety of spacing, basic group maneuvers, instant editing, and animation of the final drill.

By connecting the IIGS to a videotape player with a standard RCA cable, I can tape the drill designs as the program animates them on the GS screen. Then, by using a variable-speed audiotape deck to synchronize the sound to the drill, I can dub recordings of the music over the

Bill and two of his marching-band students on the practice field.



video, which gives me a detailed drill/music combination to show the band before any outside field teaching begins. I am able to stop the drill at any single step of the program or spot in the music and demonstrate difficult maneuvers to the students before we even reach the practice field.

The Pygraphics program also allows me to print or plot individual sheets that show precise field positions and maneuvers. Using both the videotape and the drill charts in this manner, I can help the students conceptualize the show from the audience's standpoint as well as their own. Also, I can add instructions and title graphics to the tape, creating a fairly polished video presentation. The whole process greatly increases the efficiency of my teaching and the students' understanding of the drills.

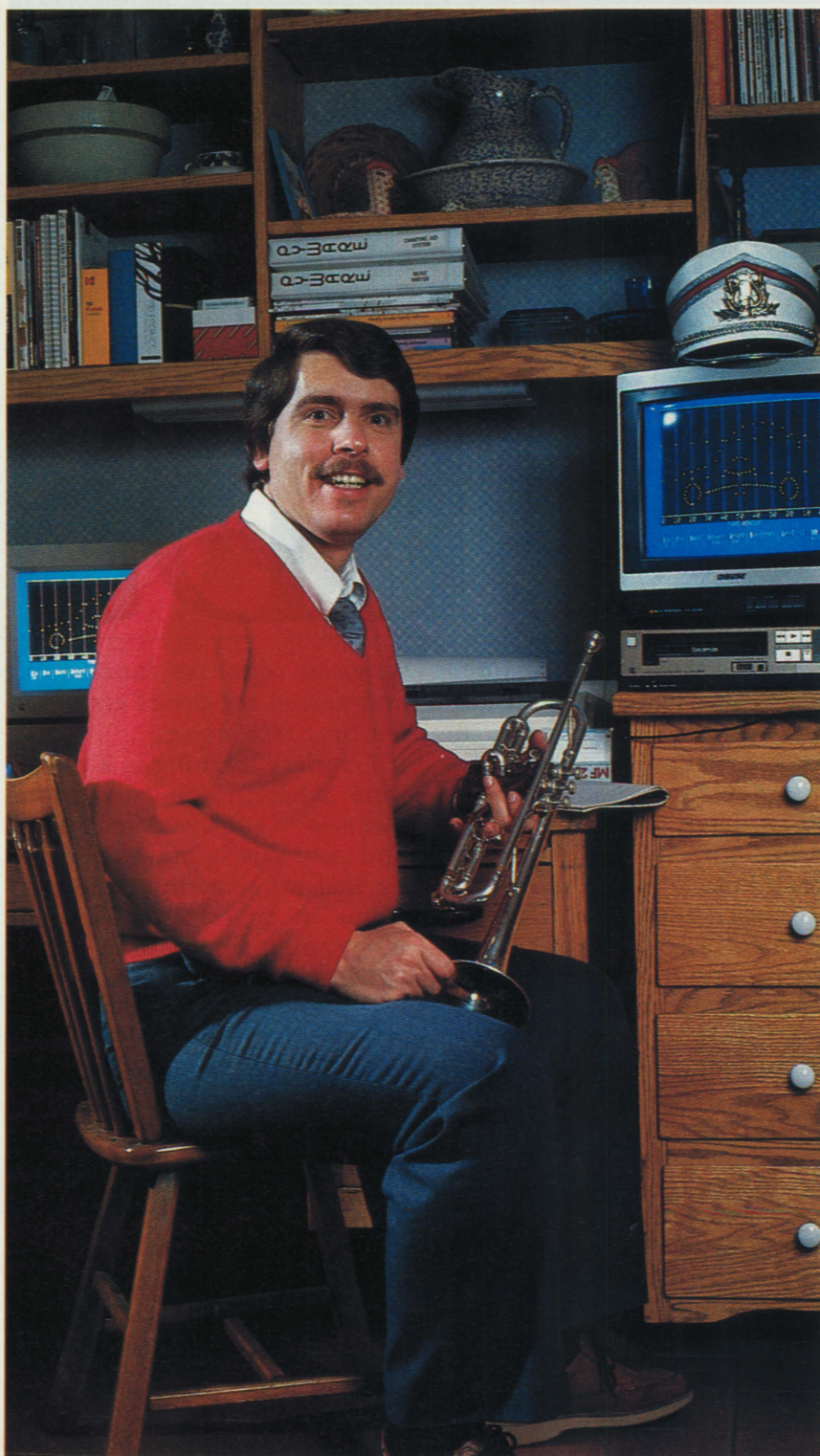
William Guegold, a resident of Mantua, Ohio, is the band director at Crestwood High School. During the last five years, Bill and his band have won several marching-band competitions, including a silver medal in the 1985 International Music Festival in Toronto, Canada.

HARDWARE/SOFTWARE/SERVICES

Apple IIGS (Apple Computer, Inc.)
ImageWriter II (Apple Computer, Inc.)

Pyware Charting Aid System
(Pygraphics)

With a VCR connected to his IIGS, Bill can tape his drill designs and dub recordings of the music over the video.



Dr. Raymond Romanczyk's school uses Apples for administration and to create learning environments for children facing severe developmental disabilities.

Apples Help Kids with **SPECIAL NEEDS**

I direct a school and treatment facility for children who have been diagnosed as having autism, schizophrenia, or pervasive developmental disorders. Some have combined diagnoses, such as developmental disabilities and sexual and/or physical abuse. The treatment procedures, therefore, must be intense and innovative.

We have three special computer-learning rooms in which the learning environments are controlled by Apple IIe computers. In these rooms, which are for use by one student at a time, the computers produce high-quality speech using an Echo+ speech synthesizer with video output to color monitors with Touch Window touch-sensitive screens. We wrote programs in BASIC and assembly language to use with the Touch Window. These programs address a wide

range of cognitive functioning and permit the use of errorless-learning techniques.

Errorless learning is a procedure wherein the correct answer is visually exaggerated and very slowly moves into the normal range as the child performs in an errorless fashion. For example, in teaching *b* vs. *d*, the *b* may initially be three times larger than the *d* and also be colored. Over time, the exaggerations gradually fade. This technique is extremely effective but underutilized, since manufacturing such learning materials is usually time-consuming and costly. The computer can alter this cost/benefit ratio, since you can program it to prepare "on the fly" lessons that would take a teacher many hours to prepare.

A favorite commercial software program we use is Writer

Rabbit from The Learning Company. Besides being extremely motivating, Writer Rabbit is great for teaching language syntax and structure to language-impaired children.

Further, with the assistance of an Apple IIe, we monitor the psychophysiological activity of the children during the learning process.

Children previously thought unable to learn actually learn quite successfully in this computerized environment, and symptoms thought to be biological have rather turned out to be more psychological. That is, aberrant behaviors some children display with a human teacher are virtually nonexistent with the computer instructor.

For very young handicapped children, computers connected to dolls and mechanical toys, such as the one in the picture, turn them on for brief periods as a reward for correct performance. Through this approach, teaching simple cause and effect, which has proved difficult in the past, becomes easy.

We utilize Apples for many other tasks as well. We use a system of four Apple IIGS computers with videotape decks and monitors to allow staff members to precisely encode, on a moment-by-moment basis, children's behaviors. The Apple IIGS computers provide a detailed analysis of the frequency and time distribution of each behavior we observe, as well as correlations to express the relationship between behaviors each child displays and the rela-

Young students get positive reinforcement from toys connected to the Apple II.

tionship of behaviors among children.

Most significantly, we have been able to achieve transfer of this learning and performance to the child's everyday classroom social environment.

An Apple II Plus computer is connected on-line to each classroom and office facility. Information about schedules and a child's status with respect to medication, allergies, and other vital information is immediately available to any staff member in each classroom. Using speech synthesis, it can remind staff verbally about different events and activities that should take place and also control remote video cameras. Administrators use a IIe and AppleWorks to maintain attendance and other necessary information.

We also use an Apple IIe with a ten-megabyte hard-disk drive to track each treatment goal for all children and to prepare detailed graphs and reports for staff and parents.

At the Children's Unit, Apple computers help us create a total delivery system for all of our students.

Raymond Romanczyk is chairman of the Department of Psychology at State University of New York at Binghamton and director of The Children's Unit, a private school for approximately 40 children with severe special needs.

HARDWARE/SOFTWARE/SERVICES

Three Apple II Plus, three Apple IIe, one Apple IIc, and four Apple IIgs computers (*Apple Computer, Inc.*)
Echo+ speech synthesizer (*Street Electronics*)
Touch Window (*Personal Touch Corporation*)
AppleWorks (*Claris Corporation*)
Applesoft BASIC (*Apple Computer, Inc.*)
Writer Rabbit (*The Learning Company*)



Janet Calvert's deaf students use Apples to create a computer-literacy videotape that improves their communication skills and connects them with students in other schools.

He Is Major Player in **PENPAL PROJECT**

For many deaf students, communication and written language are too often a classroom chore in a workbook rather than a meaningful experience. By using Apple II computers, integrated with other technologies available in the classroom today, I created a multimedia communication project that expanded my students' skills and their perception and knowledge of the world around them.

I located two teachers of the deaf in other states who used computers and had access to a modem, TDD (telephone for the deaf), video camera, and VCR. I wanted my students to become penpals with students whose schools and environments were different from their own inner-city environs.

Having penpals suddenly made the experience of communication meaningful and exciting. With this excitement came an increase in communication

skills, both oral and written. My students began by designing their own letterheads and writing letters of introduction. One of their goals was to find out about their penpal's school, home, and town.

Shortly after the first exchange of letters, we began accompanying the letters with a videotape in which students talked to their penpals.

As part of this project, my students created a "computer literacy" videotape and booklet. The videotape presented the correct terminology for computer components and demonstrated the proper sign in sign language for that same part. The booklet included sections on the care of the computer and discussed various computer applications such as The Print Shop. The students sent the tape and booklet to each of their penpals' schools.

The computer-literacy video-

tape was a major undertaking for profoundly deaf students whose average language, reading, and writing skills were at a first- to second-grade level. They planned the content, organized the presentation of material, wrote the script, and spent weeks rehearsing their parts. They used word-processing software, graphics software, and The Print Shop to produce and illustrate the booklet.

Additionally, the students explored the relative merits of modems and TDDs and the dif-



Janet's students use their Apple II computers to communicate with other deaf students.

ferences in their uses. Learning that many people own modems, whereas most TDDs are owned only by deaf individuals, has widened their horizons.

By the end of the year, my students had used the computer with a video camera, modem, and TDD. They had explored various tools of communication and integrated them into a single experience, opening channels of communication with new friends and making them more aware of their world. Participating in the project also

helped increase and develop their oral and written language skills. Now my students better understand how computers can empower them, despite their handicaps, to meet challenges.

Janet Calvert is a teacher at the Bruce Street School for the Deaf in Bloomfield, New Jersey, and coordinator of Project I.D.E.A. An active member in Apple Computer Clubs, Janet was runner-up in that organization's National Merit Competition in 1985. Currently, Janet and her students are orga-

nizing a computer fair to show how Apple computers can help people with special needs.

HARDWARE/SOFTWARE/SERVICES

Six Apple IIe computers (*Apple Computer, Inc.*)
ImageWriter II (*Apple Computer, Inc.*)
Apple Modem 300/1200 (*Apple Computer, Inc.*)
MultiScribe (*StyleWare, Inc.*)
Dazzle Draw (*Brøderbund Software*)
The Print Shop (*Brøderbund Software*)

STAN GODLEWSKI



Virginia Carney's creative programs and keyboard modifications help a disabled child get the maximum benefit from her computer.

Apple II Plus Helps Child's

MOTOR SKILLS

The first time I met Elizabeth Smith, I could see that there was an intelligent mind behind those expressive eyes. Unfortunately, because of a birth-related brain injury, that mind had to cope with a body that didn't take orders too well.

My involvement with Elizabeth began as a "patterner." I was one of many volunteers who literally moved Elizabeth through a relentless program of crawling and breathing exercises designed to stimulate new pathways in her brain. Since I was spending every spare moment at home discovering new possibilities for my Apple IIe, I was overjoyed when Easter Seals lent the Smiths an Apple II Plus and some software.

Elizabeth was fascinated with

the computer from the beginning, but she did not have the fine-motor skills necessary to press a single key. Someone else had to enter most of her responses. I knew Elizabeth needed to feel the thrill of accomplishment that comes from interaction with the computer—making something happen by your own action. With effort, Elizabeth could zero in on the space bar, so that was our starting point. Using Shape Mechanic, I invented space-bar games.

The first game was simple, a stick-dog moving toward his doghouse. He paused several times and had to be nudged along (by a press of the space bar). When the dog reached his house, the computer played the

song "Where Oh Where Has My Little Dog Gone?" in an abbreviated version. Elizabeth loved it! From there, my imagination took over. My next game had a garden that needed watering so the flowers would grow (right before her eyes!). That one end-



ed with "Country Gardens." I developed games with toys: a doll that waved its arms to the tune of "I Dropped My Dolly in the Dirt," toy soldiers that marched to "Parade of the Wooden Soldiers," and a saucy jack-in-the-box. Another game

drew the Statue of Liberty on the screen, with "The Star-Spangled Banner" as a fitting ending.

As Elizabeth's motor development and motivation increased, she needed a challenge, a choice of responses. I found

that bathroom-faucet markers served my purpose. They were hollow, so I could fill them with the clay-like substance you use to stick posters to a wall. The markers could fit over any key, and you could remove and put them back at will. Most important, hitting a marker registered only the key under it. Now Elizabeth could respond with several keys, as long as they were not next to each other. I wrote new games that required a choice of responses and introduced some commercial software to her.

Elizabeth is in school this year, and her patterning continues on a part-time basis. The Apple II is a source of pleasure at home and an important part of her education at school. Knowing that I had a small part in getting Elizabeth started in something that will make her future brighter gives me a sense of satisfaction.

The Grand Prize Winner in A+ magazine's "How I Use the II to Teach" homelpersonal category, Virginia Carney is a former high-school mathematics teacher. Virginia retired from formal teaching 11 years ago when she and her husband, J.W., moved to Newport, Arkansas, to set up his medical practice. Virginia and J.W. have owned an Apple IIe for four years.

HARDWARE/SOFTWARE/SERVICES

Apple II Plus (*Apple Computer, Inc.*)

Applesoft BASIC (*Apple Computer, Inc.*)

Shape Mechanic (*Beagle Bros*)

Virginia shows Elizabeth the Apple IIgs she won in the "How I Use the II to Teach" contest.

Blind American history professor Norman Coombs uses an Apple II Plus equipped with a speech synthesizer to teach sighted and deaf students.

Apple Acts as College TEACHER'S AIDE

Three years ago, an Apple II Plus with an Echo speech synthesizer changed my life. I am a totally blind college history

professor at the Rochester Institute of Technology. With the aid of my computer, I can prepare and proof my work by my-

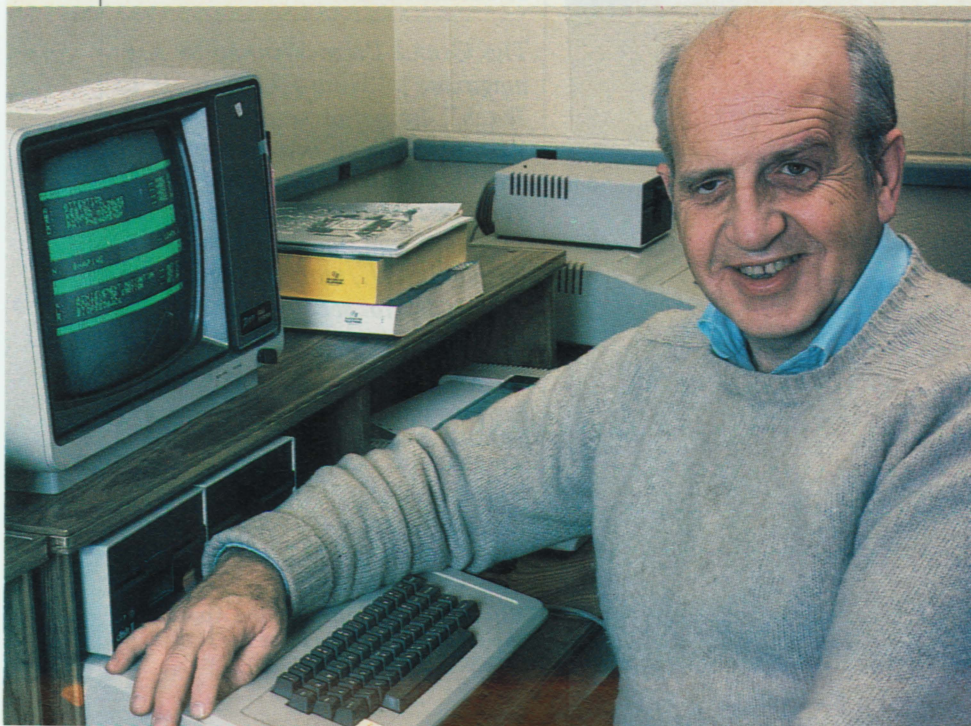
self; "read" my student assignments; and store and retrieve data, including student grades, without assistance. Thus, I have almost eliminated the need for human readers, which allows me to work at my own convenience and not have to fit into a reader's schedule.

I use my Apple II Plus in numerous ways. First, because most commercial software doesn't take advantage of speech output, I have learned BASIC and created some of my own programs to assist me in my work. I wrote a simple word-processing program, for instance, to help me prepare my notes and check capitalization.

Second, I use my computer and a modem to connect to the college's mainframe computer. This setup allows me to use electronic mail to forward materials to my secretary, freeing her from the necessity of retyping my work. Electronic mail has also become my main means of communicating with other faculty members.

I also have my students submit their work to me by electronic mail, which allows me (with the aid of the speech synthesizer) to "read" it. During this past year, I developed an on-line "conference" to replace a discussion class that I was teaching. I use the Apple to access the conference and to prepare and store materials on the college's mainframe. I find that the students who participate in

Professor Coombs uses his Apple II and the campus mainframe to communicate with his students.



William Reed uses an Apple IIe to tutor a functionally illiterate adult neighbor in reading and learns of a side benefit: family harmony.

Apple Opens Door to

ADULT LITERACY

our on-line conferences do as well as those who attend "live" discussion classes.

Third, I keep a disk with sample exam questions on it in the library. Students can access it to see the kinds of questions they can expect in an exam.

Since the National Technical Institute for the Deaf is on our campus, I often have deaf students in my classes. When they come to visit me in my office, we use a program I wrote to let us communicate. We take turns typing on the Apple. They read the screen while I listen to the speech synthesizer reading their words. This year, I'll be teaching an all-deaf class using the on-line conference. Thanks to technology, the class members will not need an interpreter, and I will not need a reader.

I wish the personal computer and speech synthesizer had been invented about 40 years sooner—studying and teaching would have been much easier!

Professor Coombs, blind since the age of 8, teaches American history at the Rochester Institute of Technology, Rochester, New York, and is the author of Black Experience in America (Twain, 1972).

HARDWARE/SOFTWARE/SERVICES

Apple II Plus (Apple Computer, Inc.)

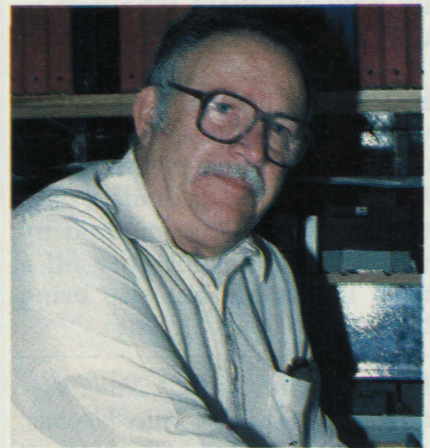
Echo Speech Synthesizer (Street Electronics)

Talking TermExec (Exec Software, Inc.)

AppleSoft BASIC (Apple Computer, Inc.)

My friend John stopped by one evening to return a tool and, although I was busy at my computer, I invited him in. I could see that he was very upset. He said that he had been quarreling with his 13-year-old son, that they had nothing in common, and that they couldn't converse without having an argument start.

As we sat talking, I remembered that his son had recently received an Apple IIe from his grandfather. John had told me that it was a waste of money because the boy only played games on it. When I suggested that the computer might be a catalyst for understanding between them, John grudgingly agreed but insisted he wasn't interested in learning about computers. I pushed the matter and told him I would gladly teach him what I knew and would loan him the necessary books and manuals. It was then that John became very agitated



and blurted out that he could never use a computer because he didn't know how to read and that he was too old to learn.

I was astonished! I had known John for almost 15 years and I had no inkling that he couldn't read. John said that he was sure that even his family didn't know. He confessed that his usual contrariness was mostly a cover-up for not wanting to participate in activities that might require reading. John and I talked for several

hours before he finally agreed to secretly work with me and my computer. He knew that I had some experience tutoring adult functional illiterates and that I really wanted to help him.

I found that he knew the alphabet and could recognize many common words. We structured his reading lessons around computing, and he used my computer for tutorials and drills on words, grammar, and syntax. When he suggested changes in the material, we worked together to revise the programs and make them more meaningful to him.

It's almost a year later, and John is not only trying to read everything in sight (with a fair amount of comprehension), but he is also doing a bit of programming. He and his son are working together on a program for tracking baseball scores. They are also teaching Mom how to enter her favorite recipes into a database. John says the only arguments in his family now are about who gets to use the computer first.

In retrospect, I think John had wanted to ask me for help with his reading problem for quite some time. It ended up being the Ile that provided both the reason and the method by which he could not only fill a need in his life but also bring his family closer together.

Bill Reed, a resident of Chula Vista, California, is a late bloomer. After dropping out of high school to join the Navy, Bill returned and graduated at the age of 35. Bill continued on to college, receiving his Master's degree at age 55. Bill is now a technical editor for Computer Sciences Corporation, where he writes users' manuals. In his spare time, Bill volunteers for Project Read, teaching adult functional illiterates to read.

HARDWARE/SOFTWARE/SERVICES

Apple Ile (Apple Computer, Inc.)
Wheel of Fortune (ShareData)

Bob Hughes uses Apples to teach his high-school business students how to succeed as entrepreneurs by helping them put together a mail-order directory.

Apples Help Teach Essentials of RUNNING A BUSINESS

Anyone who teaches business without using a computer is not preparing students for the real world. I have designed a project that shows students the tremendous potential of computers in all aspects of small business. My project is easy to adapt to most business courses.

I teach my class the inner workings of business by getting them involved in starting and operating a small mail-order business, *The National Fund Raising Directory* (a guide to products that students can sell in fund-raising activities). I chose a mail-order business because it allows for time flexibility (important in a school setting) and does not involve an extensive capital investment. During the course of this project, I cover every aspect of entrepreneurship, even those not applicable to our particular business.

We discuss and analyze costs,

break-even points, and profits, using AppleWorks' spreadsheet module and PFS:Graph with figures and projections for our own business. Based on projected sales and expenses, we set advertising rates for listings and the sale price for the directory.

Next, we seek advertisers to list in *The National Fund Raising Directory* by creating a package that contains a word-processed cover letter, a "rate card," sample directory pages, and a response form. At the same time, the class compiles lists of firms that make T-shirts, candy, jewelry, and other items into an AppleWorks database. Finally, we send out a mailing to the potential advertisers.

The class sorts the forms the advertisers return by product and firm name. We lay out the directory, using our Macintosh Plus and PageMaker desktop-publishing software, and then print 20,000 copies of the direc-

B

tory in our school print shop.

After discussing proven advertising techniques, we plan and implement a direct-mail campaign that includes a form letter and an attention-getting flier designed to sell our directory to potential customers. We send this package to all schools throughout the United States.

We use the Apple IIe computers to process orders for the directory—from recording the order and billing the account, to mailing the directories. Class members regularly prepare and review financial statements.

The students maintain notebooks of the complete business operation that recount the various aspects of our venture and

contain reflections on how they might apply each phase of our project to their own enterprise.

In my 22 years as a high-school teacher, this project is the most exciting and meaningful educational experience in which I have been involved. The motivation and interest of the students is tremendous. They develop a sense of responsibility and can see the outcomes of proper planning and the relevance of what they've learned in the classroom. When students have completed the course, I feel confident that they have the entrepreneurship and computer skills necessary to be successful on their own. That is, after all, what it's all about.

Bob Hughes has been a teacher for 18 years at Orange Glen High School in Escondido, California. In addition to fulfilling his teaching responsibilities, Bob is actively involved in DECA (Distributive Education Clubs of America), a youth organization for high-school students interested in marketing.

HARDWARE/SOFTWARE/SERVICES

- 20 Apple IIe computers (*Apple Computer, Inc.*)
- 1 Macintosh Plus computer (*Apple Computer, Inc.*)
- AppleWorks (*Claris Corporation*)
- PageMaker (*Aldus Corporation*)
- Back to Basics (*Peachtree Software, Inc.*)
- PFS:Graph (*Software Publishing Corporation*)

Bob and his students use AppleWorks and PFS:Graph to go over figures and projections for their mail-order business.



Beth Turner's son uses the AppleWorks word-processing program to emulate his publisher mom by trying his own hand in the newsletter-publishing industry.

Apple II Assists NEWSLETTER NOVICE

In the summer of 1984, I lost my job as a publisher's assistant for a small newsletter company. Although I had worked there for only two months, I had learned how to typeset by computer, sending the copy via modem to a typesetting company in Virginia. Instead of seeking another job, I decided to launch a publication of my own. The first step in the process was the

purchase of an Apple IIe.

I had been longing to buy a computer for my son, Kai, who was nine years old at the time. I was particularly interested in buying an Apple because of the wide variety of educational programs available. I also knew his school used Apple computers, and I wanted him to be able to practice his skills at home when his classes began.

I knew my husband and I could not afford a computer, but since I was starting a publication business, the computer was a deductible business expense, so we brought home a brand-new Apple IIe.

Although my son had played games on the Apple at his friend's house, he had not begun to understand the vast potential of the computer until I showed him the first printed copy of my newsletter. His eyes opened wide with amazement, and the wheels started turning.

During the next couple of months, Kai learned to use my AppleWorks word-processing program to do typesetting—mastering all the codes he needed to make indents and columns, boldface letters and italics. Simultaneously, I showed him how to use the modem to send computer files to the typesetter.

Before the summer was over, Kai had developed an idea for a newsletter entitled *Chip n' Bytes*, in which he planned to review children's computer games. He designed a cover, thought of special features including "Letters to the Editor," and drew or printed out illustrations from the games. He wrote his reviews and then "hired" me as his editor. This role provided me with a perfect way to help him refine some of his grammar and composition skills without friction, because he knew that in the publishing business most writers had a good editor.

In the end, Kai completed his



Kai learned typesetting and desktop publishing from his mother.

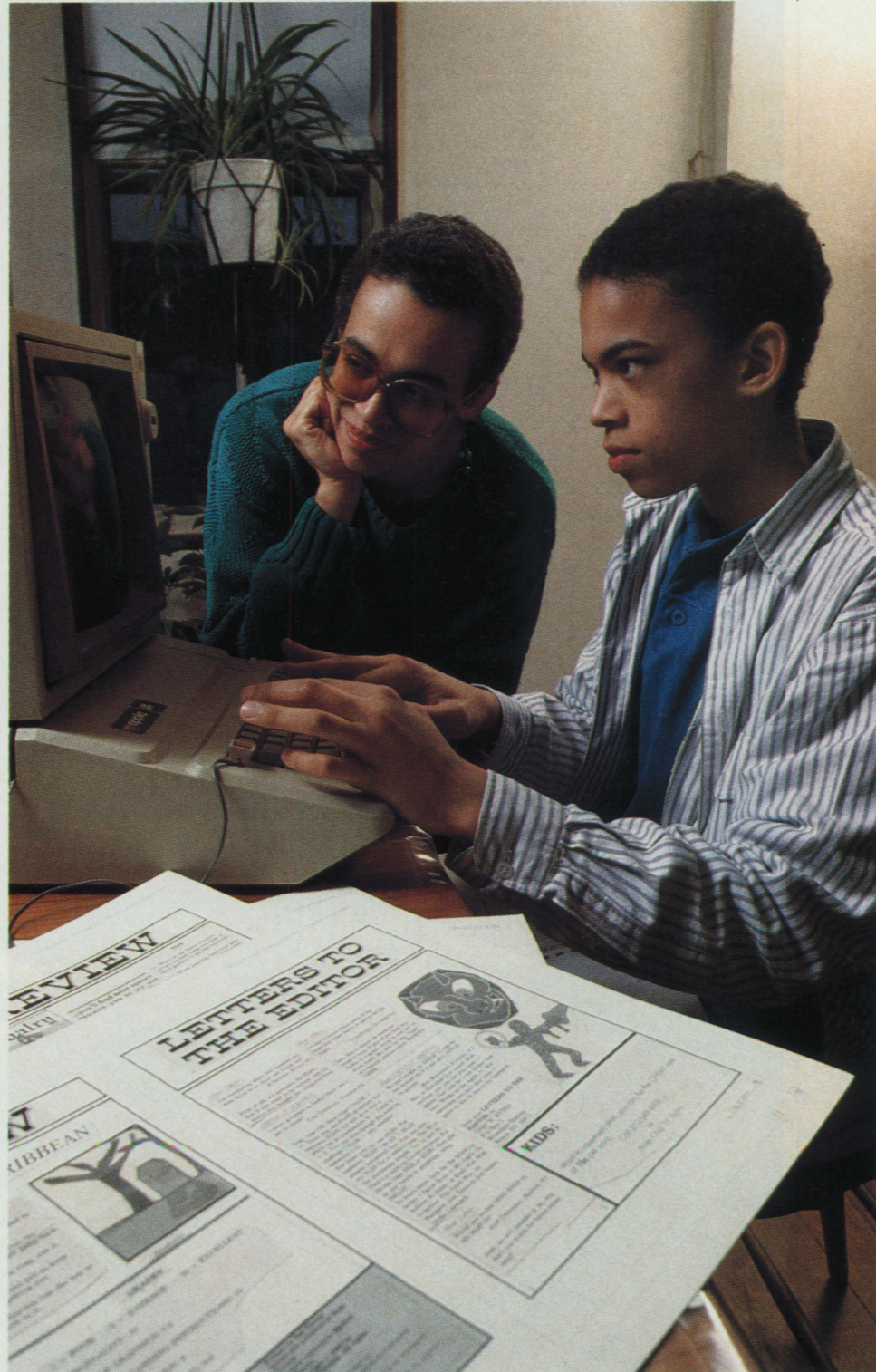
newsletter. The only hitch was when we were confronted with the prohibitive printing costs. Printing two new publications was just more than our budget could handle. But the skills that Kai learned and the enthusiasm that he gained for the computer have led to many amazing new developments.

From school, computer magazines, and books, he began to learn about the unlimited creative opportunities available to people who can program. He virtually taught himself Apple-soft BASIC and then machine language. Now at age 13, he is developing a BASIC tutor for kids that he is hoping to market. In effect, with the Apple II, he has not only learned many important new skills, but he has also learned the excitement of teaching those skills to others.

Beth Turner has been publishing her newsletter, Black Masks, a review of the black performing and visual arts, for four years. Kai, the younger of two children, is now a freshman at Fieldston High School in the Bronx, New York. Using his birthday money and money he has earned through various jobs, Kai recently purchased an Apple IIGS to experiment with his new passion: software animation.

HARDWARE/SOFTWARE/SERVICES

Apple IIe (*Apple Computer, Inc.*)
Apple Modem 300/1200 (*Apple Computer, Inc.*)
Apple Access (*Apple Computer, Inc.*)
AppleWorks (*Claris Corporation*)



Joey's next project on the IIc will be learning how to program in BASIC.



GALEN WAMPLER

Linda West experiences the fun and reward of teaching her son, Joey, everything from typing skills to computer programming.

Using a IIC to

LEARN AT HOME

To my great surprise and joy, I made a discovery three years ago when I purchased our Apple IIC. Teaching can be fun! Since that day, my son, Joey, who was seven years old at the time, and I have spent many enjoyable hours of fun and learning at the computer.

An abundance of quality educational software is available for almost any subject. I try to buy software that is as interesting and fun as it is educational, thus adding an extra incentive to spark Joey's interest. When he was offered a reward for finding the secret room with a surprise in Rocky's Boots from the Learning Company, Joey had hours of fun before he found the room with the alligator. Unaware that he was learning the basics of digital electronics, he knew only that he was playing a game and enjoying himself with the Apple IIC.

I introduced Joey to the Logo

language, another great learning tool. Logo teaches concepts of math and geometry and grows with the student. The basic commands, which are easy to learn in a matter of minutes, gave Joey confidence with computers plus the satisfaction of knowing he could write his own programs.

From his early explorations with graphics and driving the turtle around the computer screen, Joey has progressed through many phases of interest to his current passion, writing procedures for drawing and printing out the logos of his favorite rock groups, an activity that requires figuring out complex geometric angles.

I am also teaching Joey Spanish at home and have found a great help in Match Maker Spanish. The Match Maker program allows me to include the word lists we are currently studying. With a maze game as

a reward for correct answers, the program does a good job of holding Joey's attention.

Recently we moved, and Joey was forced to give up his typing class, since it was not offered in his new school. With his computer and Brøderbund's Type!, he is able to continue his studies at home, which is crucial, since he wants to be a writer. Also, learning to use the AppleWorks word-processing module has done much to further his interest in writing.

Even without the help of commercial software, the computer is a great learning aid. I have written simple programs in Applesoft BASIC to help with memory work such as learning the sequence of the books of the Bible. Very soon I intend to begin teaching Joey how to program in the BASIC language and eventually in assembly language.

Joey is ten years old now and entering the fifth grade. I feel having a computer at home has given him the opportunity to advance his learning beyond his grade level.

When Linda West became a parent volunteer in her son's school, she didn't anticipate that she would become hooked on computers, but she did. Linda immediately saw the benefits of owning a computer, and, even though she had never touched one before, she and her family become proud owners of an Apple IIC.

HARDWARE/SOFTWARE/SERVICES

Apple IIC (*Apple Computer, Inc.*)

ImageWriter II (*Apple Computer, Inc.*)

Rocky's Boots (*The Learning Company*)

Apple Logo (*Logo Computer Systems, Inc.*)

Match Maker Spanish (*American Educational Computer*)

Type! (*Brøderbund Software*)

AppleWorks (*Claris Corporation*)

Applesoft BASIC (*Apple Computer, Inc.*)

From creating greeting cards to doing their own programming, teacher Cheryl Melaragno shows mom and dad some of the joys of the Apple II.

Apple Gives Retirees New HOBBIES

For 37 years, my father worked as an electrician for the Lower Lake Docks in Ashtabula, Ohio. In January of 1984, he retired.

My father is not one to sit around and do nothing, but there are only so many chores to get done around a house before you discover that you have free time on your hands. During the summer, Dad keeps busy in his small garden, but when winter sets in with subzero temperatures and heavy snowfalls, his only activities are indoors. I thought Dad was beginning to become interested in computers when I found him reading my programming text one morning and taking notes.

I asked Dad if he would like to learn how to use the Apple IIe computer. At first he was reluctant, saying that he was too old to learn something so complicated. He said that the programming text seemed "pretty tough" to him. I said, "Dad, try it. You'll be surprised at how easy it is to use a computer." He agreed to give it a try.

I thought our first lesson should be something fun. I

showed my father how to boot a disk, and we used The Print Shop. Since it was almost Mom's birthday, he decided to create a greeting card. Dad never did like paying high prices for greeting cards, so he was excited about creating his own. He learned quickly and went on to create some signs and banners

for Mom's birthday. Mom was certainly impressed. It was only a matter of days before my mother asked me to teach her how to use the computer, too.

My small computer "class" went on to learn to use other software. My two students had all kinds of questions. It was as though a whole new world had opened up for them. They wanted to know how to write letters and keep copies of them on a disk, how to use the computer to keep records of their expenses, and how to set up an address file on the computer. They are now starting to learn AppleWorks. Neither of my parents is intimidated by com-



Cheryl's parents are now learning AppleWorks, and her dad is also taking up BASIC programming.

puters anymore. Dad is tackling Applesoft BASIC and finding that, although programming is not easy, it is fun. We joke about establishing a schedule so that we will all have a designated time to use the computer.

I feel very proud of my parents when I hear them say to their friends, "Cheryl taught us how to do that on the computer." Needless to say, their friends are absolutely amazed. My dad's older brother has asked to see the computer work. It looks as if I will be gaining a third student soon.

Cheryl Melaragno is a math and computer-science teacher at West Junior High School and Ashtabula High School in Ashtabula, Ohio. Cheryl and her parents now use a IIGS.

HARDWARE/SOFTWARE/SERVICES

Apple IIe (*Apple Computer, Inc.*)

AppleWorks (*Claris Corporation*)

The Print Shop (*Brøderbund Software*)

Applesoft BASIC (*Apple Computer, Inc.*)

JOE DARWELL



HOME TUTORING

David Sams authored several drill-and-practice reading and math programs to help his son catch up at school.

He Helps Youngster Perform at GRADE LEVEL

My wife and I purchased an Apple IIe more than two years ago, and since that time we have used commercially written software to help our children learn the alphabet and basic math skills. The real benefits of our purchase became apparent this past year, however.

In second grade, our son's reading development was falling behind because he is one of the youngest in his class. His math skills were lagging also, and other subjects were showing signs of weakness. He was enrolled in a special reading group at school and was given extra assignments as well as a group of 244 "sight words," words that pupils must recognize without sounding them

out. If children know these words, they will usually be able to read at their proper grade level.

At this time, I became interested in experimenting with our Apple IIe and a Phasor speech synthesizer and trying to write my own programs. One program I wrote worked like electronic flash cards; it drilled him on the sight-words list, 24 words at a time.

While working with my son, I discovered that he did not have a good grasp of phonics, so I wrote a short program to drill him on the various sounds associated with letter combinations. As he practiced the drills, his reading skills showed marked improvement. At the beginning

Apple IIe (Apple Computer, Inc.)
Phasor Speech Synthesizer (Applied Engineering)
Applesoft BASIC (Apple Computer, Inc.)
Success with Math series (Mindscape, Inc.)

of second grade, he was reading at a mid-first-grade level. At midterm, his reading had advanced by eight months. By the end of the year, he was reading at grade level.

Due in part to additional computer drills with Success with Math programs (Mindscape, Inc.) and advanced work he has done at home on the computer, he is now one of the top math students in his class.

In the summer, we continue to use the IIe to reinforce the

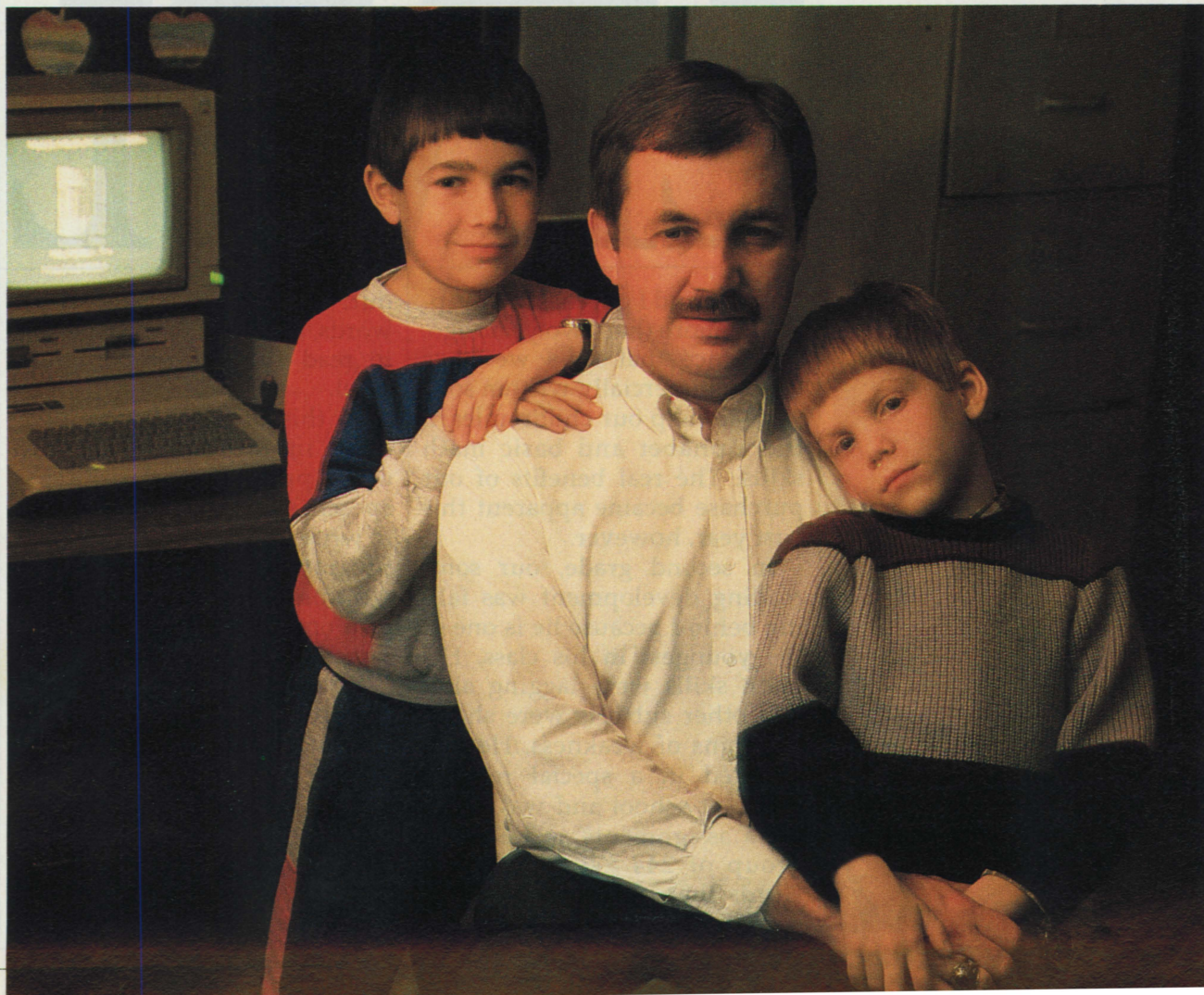
skills our son has learned during the school year. Also, my wife and I are using the IIe to prepare our other children for successful school experiences.

David Sams is an insurance agent in Cincinnati, Ohio. He taught himself how to program the Apple IIe that he has owned for four years. As president of a swim club, David uses his Apple to maintain the club's mailing list and financial records. He also prepares his income tax with the computer.

HARDWARE/SOFTWARE/SERVICES

Apple IIe (Apple Computer, Inc.)
Phasor Speech Synthesizer (Applied Engineering)
Applesoft BASIC (Apple Computer, Inc.)
Success with Math series (Mindscape, Inc.)

Beginning with commercially written software, David soon branched into writing his own programs for tutoring his son in reading and word recognition.



PRODUCT INDEX

PageMaker

Aldus Corporation
411 First Avenue South
Suite 200
Seattle, WA 98104
(206) 622-5500

Match Maker Spanish

American Educational Computer, Inc.
801 NW 63rd Street
Oklahoma City, OK 73116
(405) 840-6031

SuperPILOT

APDA
290 SW 43rd Street
Renton, WA 98055
(206) 251-6548

**Apple II Plus, IIe, IIc, IIGS,
Macintosh Plus, ImageWriter I, II,
Apple Modem 300/1200, Apple Access,
Applesoft BASIC**
Apple Computer, Inc.
20525 Mariani Avenue
Cupertino, CA 95014
(408) 996-1010

Phasor Speech Synthesizer

Applied Engineering
P.O. Box 798
Carrollton, TX 75006
(214) 241-6060

Shape Mechanic

Beagle Bros
6215 Ferris Square
Suite 100
San Diego, CA 92121
(619) 296-6400

**Type!, The Print Shop, Dazzle Draw,
Science Toolkit**

Brøderbund Software, Inc.
17 Paul Drive
San Rafael, CA 94903
(415) 492-3200

AppleWorks

Claris Corporation
440 Clyde Avenue
Mountain View, CA 94043
(415) 962-8946

CompuServe

CompuServe Information Service, Inc.
5000 Arlington Centre Blvd.
P.O. Box 20212
Columbus, OH 43220
(614) 457-8650

ComputerEyes

Digital Vision, Inc.
66 Eastern Avenue
Dedham, MA 02026
(617) 329-5400

DeluxePaint II

Electronic Arts
1820 Gateway Drive
Suite 200
San Mateo, CA 94404
(415) 571-7171

Talking TermExec

Exec Software, Inc.
201 Waltham Street
Lexington, MA 02173
(617) 862-3170

Micromodem II, Smartmodem 1200

Hayes Microcomputer Products, Inc.
5923 Peachtree Industrial Blvd.
Norcross, GA 30092
(404) 449-8791

Experiments in Human Physiology,

Biofeedback Microlab
Human Relations Media (HRM)
175 Tompkins Avenue
Pleasantville, NY 10570
(914) 769-6900

KoalaPad

Koala Technologies Corporation
2690 Mount Hermon Road
Scotts Valley, CA 95066
(408) 438-0946

Rocky's Boots, Writer Rabbit

The Learning Company
6493 Kaiser Drive
Fremont, CA 94555
(415) 792-2101

Apple LOGO

LOGO Computer Systems
121 Mount Vernon Street
Boston, MA 01208
(617) 742-2990

Graphing, Music Theory

MECC
3490 Lexington Avenue North
St. Paul, MN 55126
(612) 481-3640

Success with Math

Mindscape, Inc.
3444 Dundee Road
Northbrook, IL 60062
(312) 480-7667

**Music Matchup,
Note Trespassing**

Notable Software
P.O. Box 1556-MM
Philadelphia, PA 19105
(215) 736-8355

Astronomy and Earth Science

Laserdiscs
Optical Data Corporation
P.O. Box 97
66 Hanover Road
Florham Park, NJ
(201) 377-0302

**Back to Basics Accounting
System**

Peachtree Software, Inc.
4355 Shackelford Road
Norcross, GA 30093
(800) 247-3224

Touch Window

Personal Touch Corporation
4320-290 Stevens Creek Blvd.
San Jose, CA 95129
(408) 246-8822

Point-To-Point

Pinpoint Publishing
5865 Doyle Street
Suite 112
Emeryville, CA 94608
(415) 654-3050

Prometheus 1200A Modem

Prometheus Products, Inc.
4545 Cushing Parkway
Fremont, CA 94538
(415) 490-2370

Pyware Charting Aid System

Pygraphics
P.O. Box 639
Grapevine, TX 76051
(800) 222-7536

Echo+ Speech Synthesizer

Street Electronics
1470 East Valley Road
Santa Barbara, CA 93150
(805) 565-1612

Wheel of Fortune

ShareData, Inc.
7400 West Detroit C-170
Chandler, AZ 85226
(800) 328-6061

PFS:Graph

Software Publishing Corporation
1901 Landings Drive
Mountain View, CA 94309
(415) 962-8910

MultiScribe

StyleWare, Inc.
5250 Gulfport, Suite 2E
Houston, TX 77081
(713) 668-1360

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